IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication AUGUST 31, 1961

Benyas-Kaufman

★ Ex-Cell-O's Bixby and Bendix's Ferguson Discuss:

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Steel Prices Under Attack p. 55

Aluminum Upturn Has Problems p. 60

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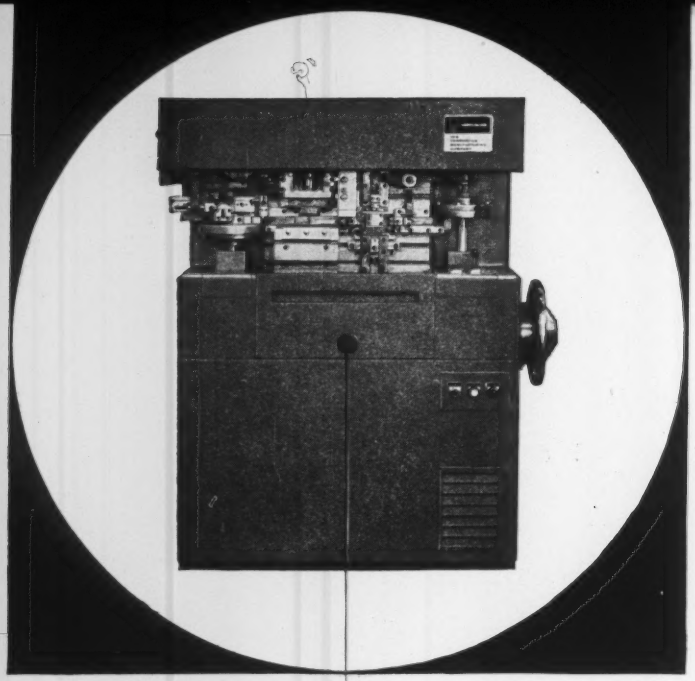
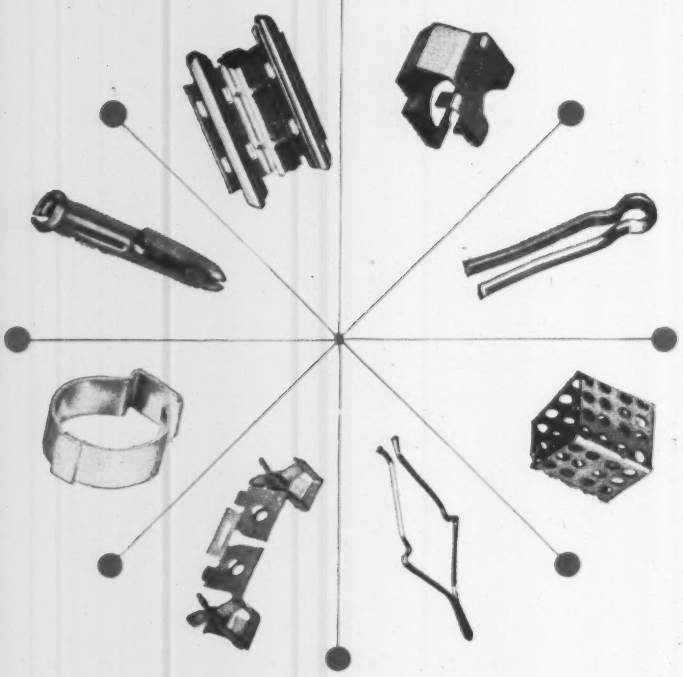


This is the machine

These are its products



If you recognize parts like these you should be familiar with this machine

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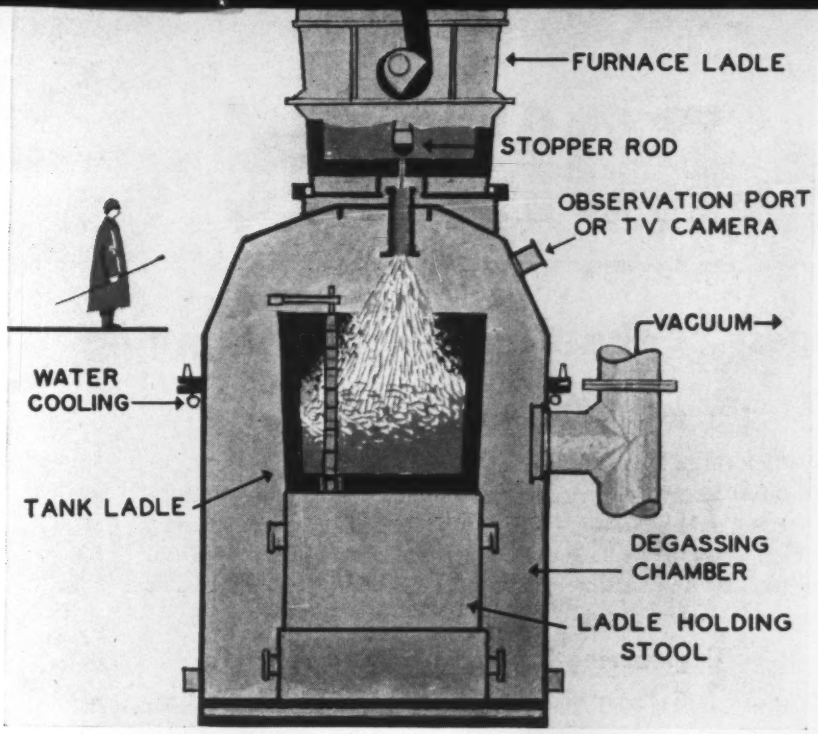
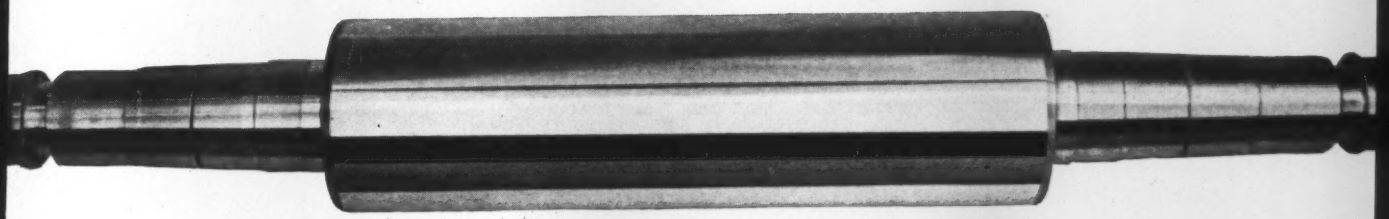
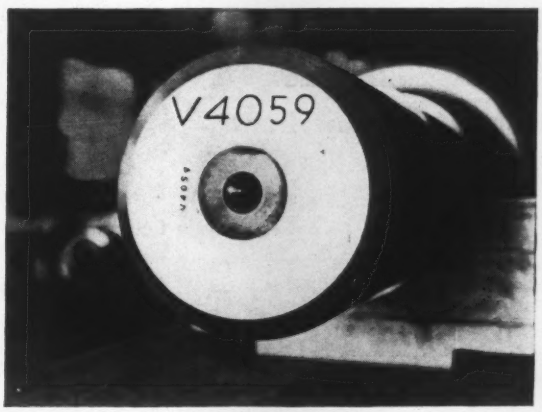


Our advanced steel-pouring techniques now permit us to pour molten steel from a furnace ladle to a secondary ladle within a vacuum chamber, and thereby remove harmful gases. The secondary ladle is then removed from the chamber and ingots of suitable size for hardened steel rolls can be cast under a blanket of inert gas.



When you use Bethlehem vacuum-degassed hardened steel rolls, you add many tons of production per roll. Made from steel that's sounder, tougher, cleaner . . . these rolls have proved their longer service in some of the biggest rolling mills in the country. As of today, there are over 3000 in service. There's no price extra! And deliveries are excellent. For all the money-saving details, get in touch with our nearest sales office.



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Special This Week

N-C Machine Tools: Rapid Growth?

It looks like the long-awaited automation revolution is about to take place. Numerical controls will serve as the prime weapons of far-sighted machinetool builders. H. G. Bixby, president of Ex-Cell-O Corp., (left), discusses the role of control systems with M. P. Ferguson, president of the Bendix Corp. p. 85

Attack on "Phantom" Steel Prices

A powerhouse of Democratic senators attacked steel price increases, before they are a reality. The organized protest reflects the full strength of the Democratic majority. Steel industry leaders watch the market instead of reacting. p. 55

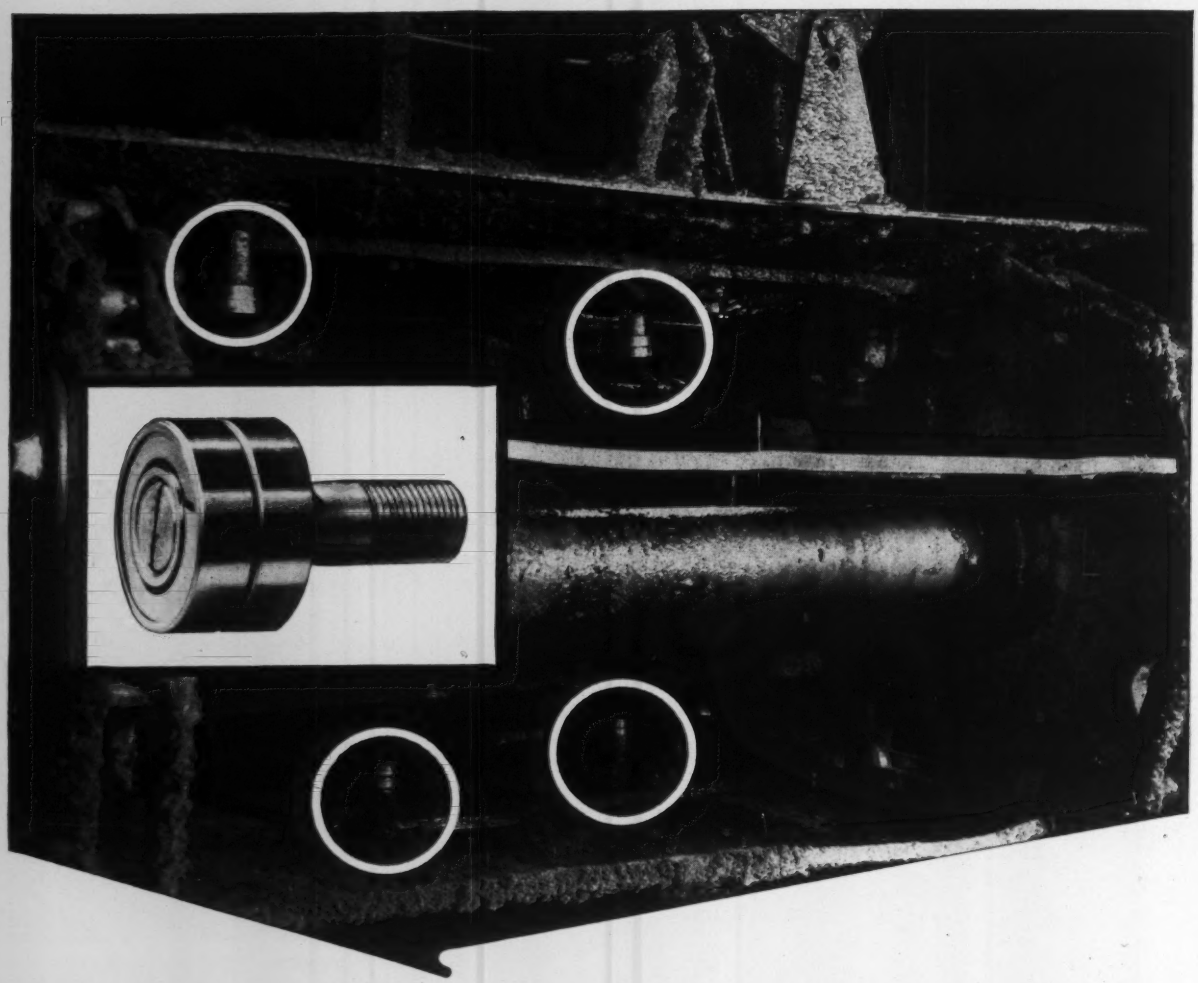
Conveyors Put Inventory to Work

An in-process inventory system feeds components right into various assembly lines. These lines turn out 280 different products. Overhead conveyors tie all operations together. Within 72 hours, stock items wind up as packaged, finished products. p. 92

Next Week

What's in the New Defense Budget?

The Berlin crisis has resulted in a new, bigger defense budget. Next week's Special Report analyzes the pattern of defense spending, pinpointing how the budget breaks down, where the money will be spent, and what industries will do to the work.



When thrust loads overpowered original bearings... Bearings, Inc. had the answer!

The original bearings on this automatic machine failed after a short time because they weren't designed to take the thrust loads to which they were subjected. Bearings, Inc. engineers designed and had built a special stud on which were mounted two permanently lubricated and sealed ball bearings.

To keep the cost of this design to a minimum Loctite®, a permanent bonding agent, was used to hold the bearings to the stud. This eliminated shoulders, locknuts or rings yet the bond is as strong as the best press fit.

This installation has now been in operation for many months with no failures reported.

This is not an isolated example of our services — surveys of bearing requirements, inventory control, application engineering, maintenance schedules and procedures are a regular and continuing part of our service to all customers to whom we supply replacement bearings.

Tell us how we can help YOU!

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Have We Lost Our Marbles In Our Latin American Plans?

The shouting, the backslapping and the "embrazos" are over. The 8000-word Alliance For Progress was signed recently at Uruguay.

Sooner or later, we will foot a bill that may run to $10 billion or more in 10 years. Purpose: To help raise the standard of living for downtrodden South Americans—people who, up to this time, have had scant attention from most of their "betters" in their own nations.

The agreement is a fact—on paper. Now the details will unfold over the years. If we live up to the terms and if we insist that South American nations do their part in tax and land reforms and give a square deal to peasants, a start may be made.

It is disturbing to note that during most of the meeting, we—who will bear the brunt of the cost—had to be on the defensive. It appeared almost as though our representatives should have stayed outside the hall until told to come in when all were ready for them.

In dispatches to The IRON AGE, a week ago from South America, we said that Venezuela, Brazil, Peru, and Argentina were turning either to the left, were ripe for revolution, or were flirting with Castroism.

Since then there has been an aborted revolution in Argentina. Since then there has been an unmistakable leftward trend in Brazil.

No sooner had the ink dried on the Latin American agreement than Dr. "Che" Guevara, Cuba's representative, made a few calls. He had been affable at the meeting; so much so that other Latins praised his "restraint."

"Che," a former Argentinian dentist and now a top-level Communist and ruler of Cuba, was following the usual soapy Commie line. Feed them sugar and make like a regular guy. Then the flies buzz around.

It worked. The ex-president of Brazil greeted "Che" with open arms and gave him Brazil's highest award. This created such a storm that President Quadros resigned. He plunged his nation into a first-class crisis which has probably taken the American aid plan with it.

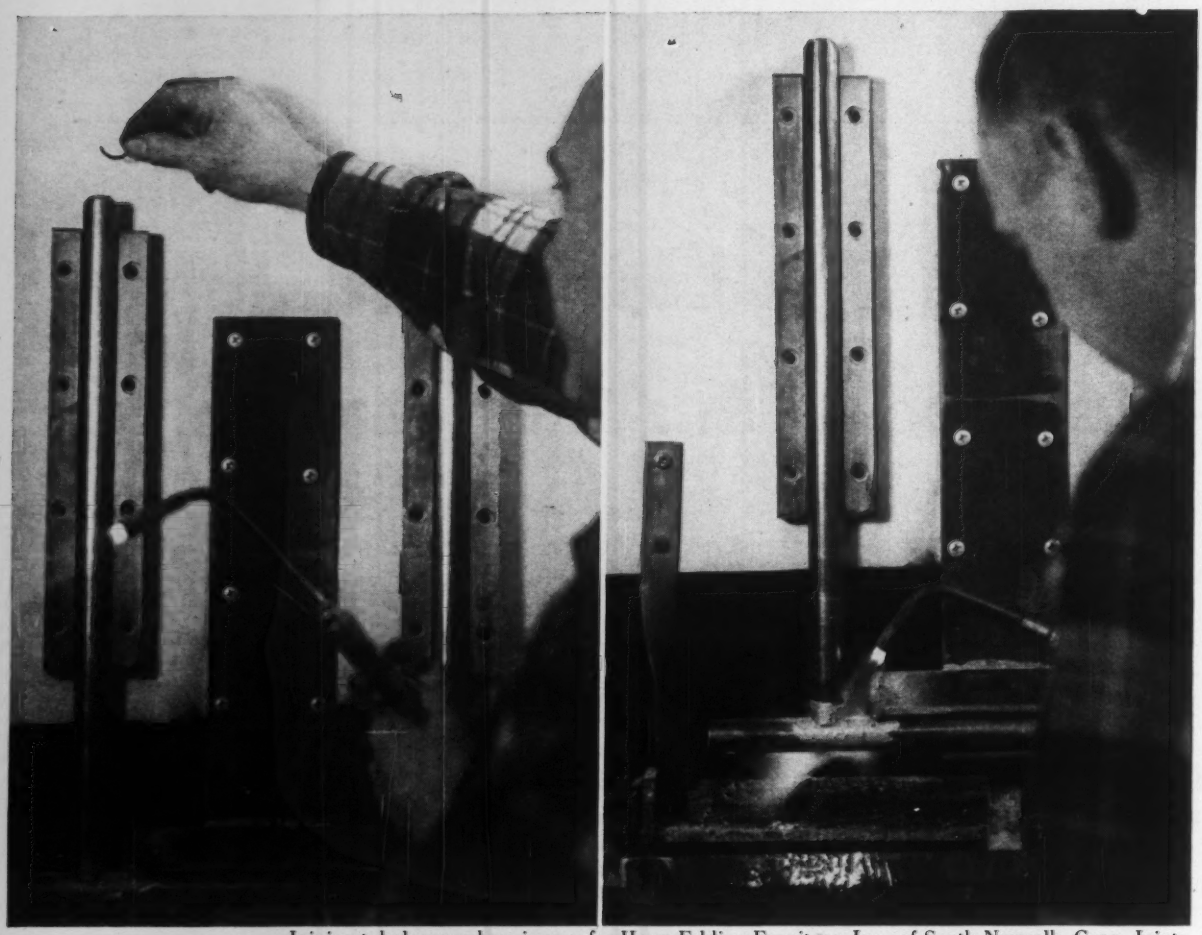
Argentina's President Frondizi, fresh from escaping an attempt to overthrow him, met secretly (until it was found out) with "Che".

Here are two nations, which will benefit greatly from the Alliance For Progress, flirting with the most dangerous man in Latin America today. This man has his orders from Moscow, has been subservient to Moscow for years, and knows exactly what he is doing!

It is time we kept from losing all our marbles —and keep our eyes on our Latin American plans.

Tom Campbell

Editor-in-Chief



Joining tubular members is easy for Howe Folding Furniture, Inc., of South Norwalk, Conn. Joints are fluxed with Handy Flux, a half-circle preform of EASY-FLO brazing alloy is dropped down the tube and a torch is applied. Result: A smooth, strong joint quickly and economically made.

How Handy & Harman Brazing Alloys

GIVE FOLDING FURNITURE 100% JOINT RELIABILITY

The experience of Howe Folding Furniture, Inc., with silver brazing merits close attention if your operations involve metal-to-metal joining of any kind. Howe manufactures folding metal tables and seats for commercial, industrial and institutional use. You can imagine the hard usage the furniture has to take—yet survive indefinitely.

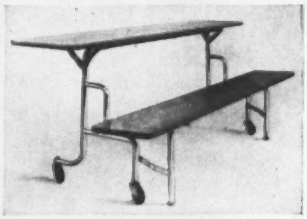
Some years ago, it was Howe's practice to purchase prefabricated steel tubular assemblies in which the joints were brass brazed on the outside surface. To improve their product, Howe thoroughly tested all joining methods, and decided to go over to silver brazing in their own plant, using Handy & Harman EASY-FLO Alloys 45 and 35. Look at the results:

Complete Joint Reliability: Since adopting silver brazing, Howe has completely eliminated the problem of broken joints.

Economy: Silver brazing costs Howe less than other methods, requires less heating time, simpler equipment, much less cleaning and grinding of joints.

Appearance: Silver brazing provides a smoother, more attractive joint, that can be plated directly.

Is it any wonder Howe says: "We'd stay with silver brazing even if it cost more." There are few fields of industrial activity where the strength, high production rates and economy afforded by the Handy & Harman family of silver brazing alloys cannot improve the look of the balance sheet. Interested in complete details? Just write for a copy of our Bulletin 20 — it's packed with engineering and application data.



Howe cafeteria table-bench is converted to an auditorium bench with backrest in a single motion. Silver brazed joints easily absorb strains.

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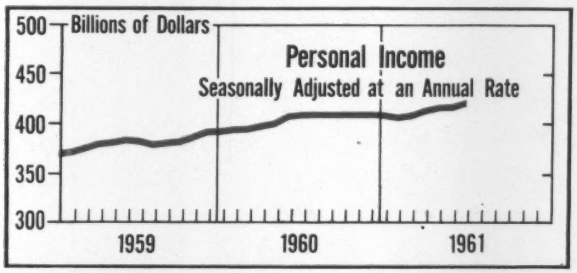
New Record For Personal Income

Personal income in July hit a record-breaking annual rate of $421.8 billion. This is the sixth straight month of income increase, and the fourth consecutive one of new records.



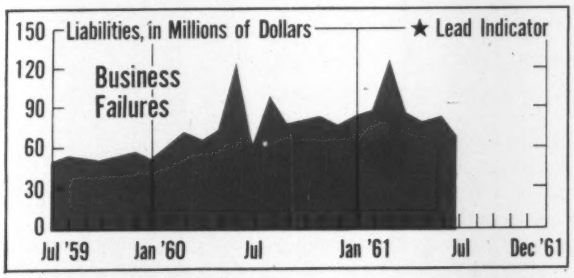
July income was up $4.5 billion over June, and $17.1 billion over July of last year.

A significant point about the July income gain is that it is a widespread one. Gains were scored in manufacturing, construction, trade and transportation. Factory payrolls rose $500 million from June to an annual rate of $89.4 billion, highest since May 1960.

Business Failures Drop in July

Those who find business failure data a reliable indicator of business strength found encouragement in July data. Business failures dropped to a 10-month low of 1275 companies. Liabilities dropped to a 12-month low of $69.2 million.

But the business survival rate calls for a second look. Both the number of failing companies and their



total liabilities remained well above July 1960 levels. They were, in fact, the highest for any July in the post-war period. A hesitant recovery is reflected.

Steel Demand Boosts Ore Shipping

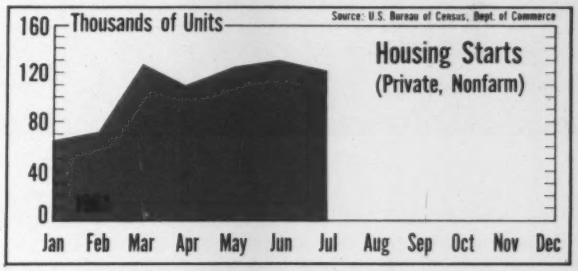
Confidence in the strength of the steel pickup is reflected in the number of ore carriers being added to the Great Lakes fleet in midsummer. It's a costly process, with little precedent. Four carriers have been added in the last month.

Demand for ore is based not only on market strength but also on recollection of the steel strike of 1959 which cost the fleet a large part of its shipping season.

Housing Starts Falter in July

Housing starts in July dropped to 120,600 units, down from 128,700 in June.

There is no sustained recovery pattern in housing. July marked the second month since the start of the year that housing starts showed a month-to-month decline. The spotty showing of housing continues to reflect soft demand. And the new Housing Act is not likely to affect this demand very much. For one, the new act is largely "permissive" legislation. Already, home builders and buyers are complaining that



lenders are not coming through with the funds and the terms indicated in the act. Some mortgage funds will fade as the recovery ups money demand.

Recovery Lull Clouds Picture

The present recovery doesn't offer a clear picture to a great number of people. One national columnist, in fact, reports a flood of letters from readers asking: "Where is this recovery you write about so much?"

The answer is simple, if not convincing.

The recovery is a spotty one. Some areas of the economy are hitting new peaks. Production is one. But many economic signs that people can see and experience are showing halting progress. This is true in employment, retail sales and housing.

Also, the summer lull and the auto changeover period hit at a critical point in the upswing. This took the full wind out of business sails.

But summer is almost over and the new cars are almost ready. The economy is set to roll again, this time with the added fillip of stepped-up government spending. Recovery should soon be clearly visible.

SLABS, BLOOMS AND ROUNDS ON THIS VERSATILE MILL

Quick handling of ingots another dividend

"Big investment, big dividends" sums up the new automated blooming mill illustrated above. Key component of a new $14 million steel plant, it was built and designed by Bliss' Rolling Mill Division to enable its owner, a prominent manufacturer of heavy equipment, to meet mounting orders for seamless tubing and welding fittings.

Here is automation at its smoothest. With only a handful of men in efficient control pulpits, the plant can turn out blooms of many shapes and sizes.

Heart of the operation is a new, 40" x 90" high-lift blooming mill, whose rolls are automatically set for each pass by punched cards. Taking the ingots poured by the new 100-ton electric furnace, it rolls them into the size required.

Of special interest is the mill's unusually versatile design. Thanks to it, the plant is able to handle round shapes as well as blooms and slabs, simply by changing the rolls. The latter were supplied by Bliss' Mackintosh-Hemphill Division.

According to the plant superintendent, this new plant has increased the company's melting and rolling capacity a full 50%. And based on its proven operating performance, the new Bliss mill will be ready to take any additional new load in stride.

Whether your plans call for a big outlay or a modest one, it will pay you to discuss them with Bliss. To learn how other firms have . . . and have profited . . . write for our 84-page Rolling Mill Brochure, Bulletin 40-B.

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NMU: Strike Threat Ebbs on U. S. Coasts

Resumption of a general maritime strike on both East and West Coasts now appears unlikely. The 80-day Taft-Hartley Act injunction is due to expire on Sept. 21.

However, David L. Cole, chairman of the three-man Presidential fact-finding committee, reports that "We are doing amazingly well." He says he is optimistic that major points in dispute will be settled before the deadline.

The principal problem that caused the gale-size storm of protest leading to the strike—right of U. S. unions to organize crews on ship flying "flags of convenience"—has been smoothed over by most unions and ship owners. Generally, this has amounted to an agreement to continue discussions on the matter later.

The National Maritime Union, the International Organization of Masters, Mates and Pilots, and the American Radio Assn. agreed earlier to defer settlement of the question. Individual lines have reached similar agreements with the other two unions—the Seafarers International Union and the Marine Engineers Beneficial Assn.

In any event, many shipping lines would no longer be affected by a resumption of the strike when the injunction expires. The effects would not be as serious as when the strike started. By the weekend, only the West Coast had unresolved issues.

Missile Labor Group: Action Backs Words

Missile Sites Labor Commission has laid down the law for labor-management negotiations at missile and space bases. And it has backed up the law with action.

The commission made the following recommendations:

Wage rates and fringe benefits should not be negotiated if inconsistent with similar negotiations elsewhere.

In setting wages, benefits and working conditions, established national standards should be followed.

Previous collective bargaining agreements should be reviewed to check provisions which become discriminatory when applied to missile sites.

The commission showed it means business. It has ruled that wage rates at Atlas missile sites near Topeka, Kan., are "unreasonable." In such cases, the Defense Dept. and NASA are empowered to disallow future costs deemed unreasonable under the ruling.

New Minimum Wage Takes Effect Sept. 3

A wage hike is due about 2.5 million workers starting Sept. 3. That's when amendments to the Fair Labor Standards Act become effective. They raise the minimum wage to $1.15 per hour for 24 million workers already covered and set a $1.00 per hour minimum for 3.5 million newly covered workers.

It's expected that 2 million workers will get wage hikes of up to 15¢ per hour. About 600,000 of the newly-covered workers now get under $1 per hour.

Within two years the minimum for workers already under the law will go up to $1.25.

How Long Will a Strike Last?

How long can you expect a strike to last?

This often depends on how well striking workers can stand the loss of a weekly paycheck, says the National Industrial Conference Board. Its conclusion is based on a study of 102 national and international unions with about 13.9 million members.

Of the total surveyed, 57 have strike benefit plans for their 5.8 million members. Of these, 41 have special strike funds.

Unions with formal plans usually set aside a specified amount of the dues paid to the union. This ranges from a low of about $1 per year for the Utility workers, to $1.25 per month for the strike funds of the United Auto Workers and United Rubber Workers. Most set aside 20¢ to 50¢ per month; the median is about 30¢ a month.

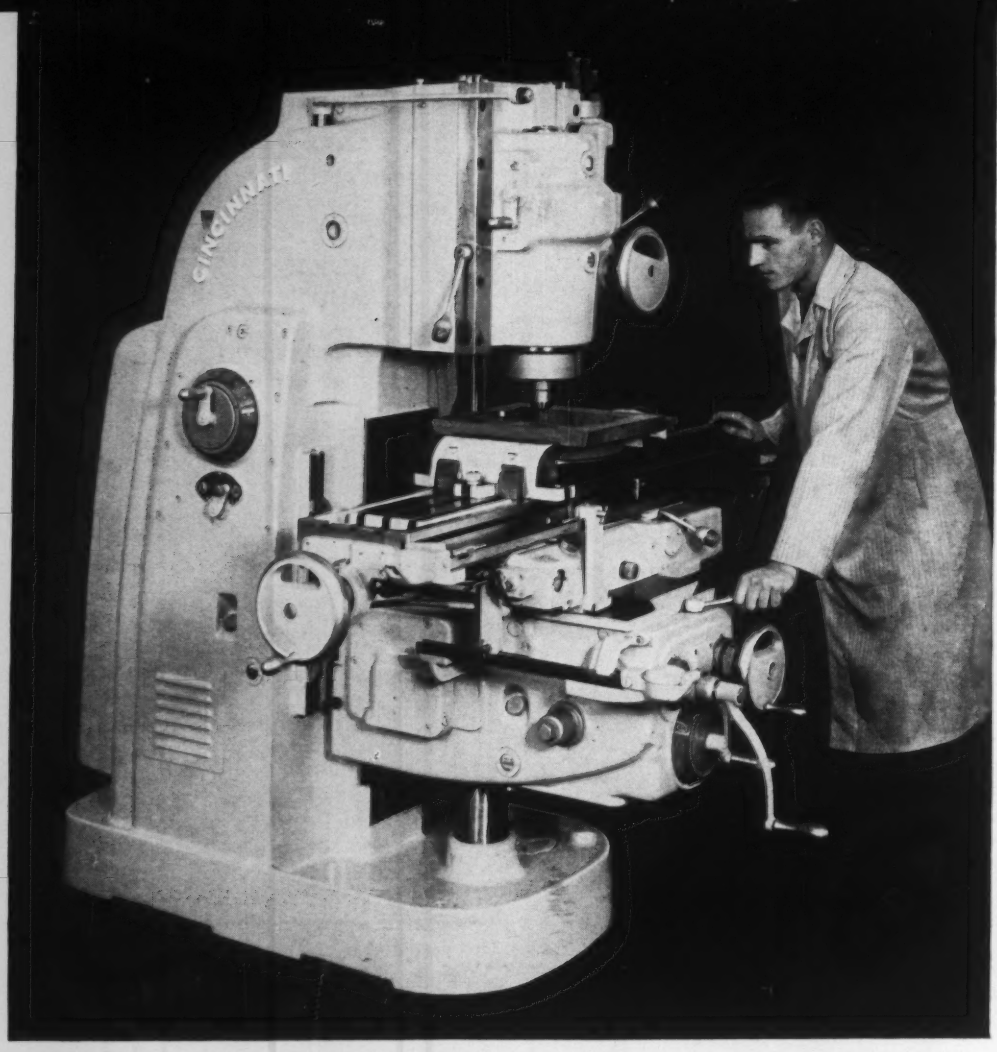
Financial assistance provided varies considerably. Flat-sum payments are made by 26 unions. They range from the $5 a week paid by the Brewer's Union to a high of $50 a week paid by the Photoengravers and independent Mailers Union. The median is $20.

Most unions have a sliding-scale payment plan. It's based on individual need, marital status, and number of dependents. Some unions set minimum and maximum payments for strike aid. And some don't give cash; they pay rent and utilities, distribute groceries.

Strike benefits seldom start immediately, although one union pays benefits after the first day and another pays the first week if the strike goes that long.

Sixteen unions start payments during the second week, 20 during the third week, and two start during the fourth week.

CINCINNATI



Progressiveness....

the company image acquired when you put NEW

CINCINNATI MILLING MACHINES in your shop

What do customers, stockholders, employees think of your company? Progressiveness is the image everyone wants to see. In metalworking, one way to create a favorable company image is through new, modern machine tools in the shop. For milling operations, the finest and most impressive machines are built by CINCINNATI. And, they have the greatest profit potential. Knee-type machines, for example, are built in four service groups:

- TOOLMASTER, for light duty toolroom work.
- ML and MI, for general purpose toolroom and semi-production milling, light to medium duty.
- DIAL TYPE, for the widest range of toolroom and semi-production milling, medium to heavy duty.
- HIGH POWER and DUAL POWER DIAL TYPES, for heavy duty general purpose toolroom and semi-production milling.

All are top performers in reducing costs and eliminating unnecessary physical effort. All are top candidates to replace the 10-year and older milling machines in your shop. Call or write today, and we'll be glad to send you complete details and catalogs. **Milling Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.** *REdwood 1-2121.*

KNEE TYPE AND BED TYPE MILLING MACHINES • DIE SINKING MACHINES • CUTTER AND TOOL GRINDERS • VERTICAL BROACHING MACHINES • ELECTRICAL MACHINING EQUIPMENT

CINCINNATI®

MILLING MACHINE DIVISION

★ Depreciation Reform Delayed

Delay of action on President Kennedy's investment tax credit plan until next year may spoil plans for depreciation reform in 1962.

Though U. S. tax experts say both a tax credit and depreciation reform are possible in the same year, it is very doubtful. The Administration and tax-writing congressmen have now pledged the tax credit for 1962. Another move to lower businessmen's taxes—the effect of depreciation changes—would not get far in Congress. Two tax breaks, especially in a period of falling revenues, are not probable.

When the House Ways and Means Committee gave up on proposed tax changes this year, Democratic committee members gave their support to the investment credit plan as the "only proper" and "most effective" way to aid the economy through tax changes.

Though some of the committeemen may object to the investment credit, privately, they are on record as giving it their support. Next year, when the tax credit comes up again—along with the call to replace it with depreciation reform they will have a hard time retracting this statement.

The congressmen can change their minds in the meantime, say U. S. Treasury officials. But the point is that President Kennedy will be the person holding them to their statement.

President Kennedy is not giving up on the credit plan for businessmen's investment in new equipment. He has promised the credit plan would not preclude revision of tax laws to allow more rapid depreciation deductions on new business equipment. But proposed revision and enacted revision are two different things.

Don't look for depreciation reform in 1962. In fact, passage of the tax credit could delay depreciation reform for several years.

■ Attorney General: Tougher Antitrust Laws

Attorney General Robert F. Kennedy is determined to tighten antitrust enforcement on business.

He wants authority to demand, and get, corporation records in antitrust cases.

The Attorney General wants legislative authority to expose identical bidding practices. He now has authority from the President to gather and publicize identical bids submitted to the Government. But he wants Congress to make businesses include affidavits in their bids swearing that there has been no collusion with other companies.

On top of this, he is supporting bills to make corporation executives responsible for company antitrust violations and increase penalties for these violations. These bills will be discussed in hearings before Sen. Estes Kefauver next week.

■ Who's to Control Public Works Dollars?

Federal public works spending looks like a controversial issue in the next session of Congress.

President Kennedy plans to ask Congress next year for standby authority to start public works projects when and where needed to combat unemployment.

This plan is deceptive in the light of the President's failure to support public works spending this year. It appears to be an antidote to counteract the ire of congressmen who wanted big public works spending this year.

■ Transportation To Get a Close Look

Transportation problems facing corporation traffic departments are getting a going over by the Federal government. Recommendations on how to solve the problems of the ailing transportation industry will go to the White House by Nov. 1.

Before that date, the U. S. Commerce Dept. will tell President Kennedy what legislative and administrative action is needed to aid transportation.

An action program is being developed by Dr. G. E. Germane, a special Commerce Dept. consultant now on leave from the traffic department of U. S. Steel Corp.

The study will concentrate heavily on the problems of the railroad industry.

■ Import Hearings Move to Machinery

Congressman John H. Dent (D., Pa.), and his committee on the impact of imports and exports heard testimony from the consumer goods, metals and metals products, and the building materials industries this week.

But, like the steel and aluminum industries earlier, spokesmen for these industries did little to support the protectionist attitude that import restrictions are needed to stop U. S. unemployment.

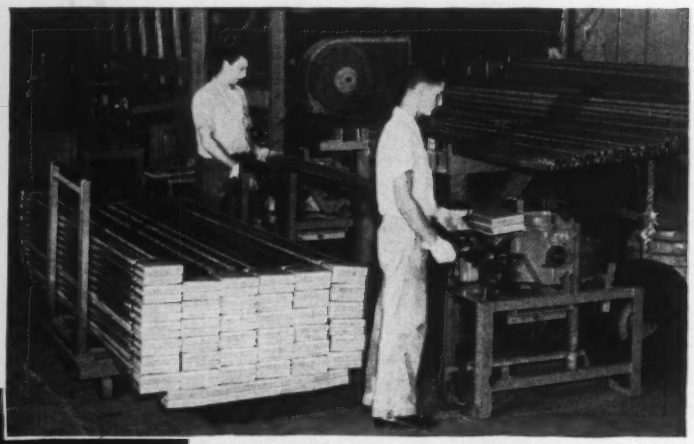
Congressman Dent plans to hold more hearings soon. Testimony will be taken from the machinery and machine tools industries.

3 ways to get maximum protection with minimum packaging

ENDS

A single piece of corrugated board and steel strapping at each end of these 10-foot lengths of tubing make a neat, square package that places effective protection where it is needed, takes little material, and is easy to handle, stack, store and ship.

Two men, each with a Signode M2 power strapping machine, stack, cap and strap 270 packages per day, as against 130 packages per day with hand strapping tools.



EDGES

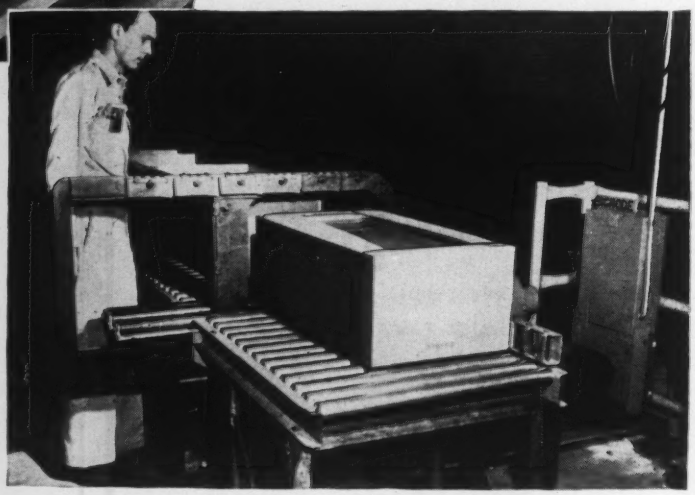
Long sheets of laminated plastic are paper wrapped, then edges are enclosed in strips of corrugated. Steel strapping is automatically applied at just the right tension to make a sturdy unit package. Savings in packaging costs are substantial, protection is practically perfect.

Operatorless strapping with a Signode M20 power strapping machine. Conveyor is powerized. Strap placement is controlled by a conductive ink mark on the package.

4 SIDES

Metal shelving and components are strapped in these containers that are open top and bottom. They are typically 3′ long, 1′ high, and from 9″ to 36″ wide. The same machine straps bundles of angles or posts that are only 3″ to 4″ square. Production is up almost four times, package unit cost is down, protection excellent.

One man and this foot-pedal-operated power strapping machine strap over 1100 containers a day. The machine has an adjustable strap chute to assure maximum strapping speed.



■ These three ways to save suggest what is accomplished when the strength of quality steel strapping is used with skill and imagination. Write for free Minimum Packaging Idea Kit.

First in steel strapping

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Offices Coast to Coast, Foreign Subsidiaries and Distributors World-Wide
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Guiana Election Affects Metalworking

The recent election in British Guiana should be of extreme interest to North American metalworkers — especially in Canada. Guiana is a leading source of bauxite. In fact, Canada gets almost 70 pct of the bauxite used in its aluminum production from Guiana.

However, the elections last week brought Dr. Cheddi B. Jagan, leader of the leftist People's Progressive Party, back into power. Dr. Jagan is an open supporter of Fidel Castro in Cuba. His party ruled in Guiana prior to the Constitution which set up the recent election.

An interesting side-note to the election: United States backed a $1.25 million loan from the International Bank for Reconstruction and Development to Guiana just two months ago. And this happened at a time when Dr. Jagan's Red-lining regime was still in power.

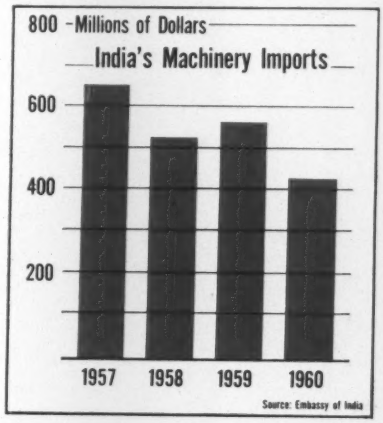
Foreign Investments

U. S. business and private investors increased their assets and investments abroad by over $5 billion last year. This raises the total holdings overseas to more than $50 billion. Largely responsible for the sharp gains was an increase in the flow of short-term funds to foreign financial centers.

India's Machine Tool Industry Is Growing

India is putting greater stress on a domestic machine tool industry. Just a few years ago, its machine-building industry was almost nonexistent. Now, there are 1100 companies building industrial machinery and equipment.

This, of course, means there will be less demand from India for U. S. tools. In fact, total reports of machinery and equipment to that nation in 1957 totals $648.48 million. That figure dropped to $420 million last year (see chart).



According to the Embassy of India, "The steady reduction of imports during a period when the pace of industrialization was stepped up is a measure of the growth of indigenous manufacture."

The Indian goal: To increase output of industrial machinery—other than electrical—from $240.03 million in 1960 to $941.43 million by 1965.

Canada's Economy Is Picking Up

The Canadian business picture is now one of gradual recovery following a "mild recession" that has lasted just more than one year.

According to the Bank of Nova Scotia, ". . . there are increasing grounds for confidence about the Canadian economic outlook.", But the bank adds, "It must be noted, however, that the rate of improvement thus far has been comparatively modest. And there are several indications that it may remain modest for some months to come."

The most encouraging aspect of the economy for the Canadians has been the increasing strength of the country's foreign trade position. During the first part of 1961, total value of exports held up surprisingly well.

Austria: Next Member Of Common Market?

Austria is making strong motions toward active participation in the European Common Market.

This would bring in the one major European holdout. It would also add to the ECM one of the nations with the top annual industrial growth since the end of World War II.

Austrian move comes at a time when the Soviets are bidding for the use of that country as a base for pouring low-priced oil into Europe.

Contract Nears For Yugoslavia Mill

A consortium of British engineering companies has reached an advanced stage in negotiations for an $80 million contract to build a new integrated steel mill in Yugoslavia.

The Yugoslavian Embassy in London confirms that preliminary agreements have been reached. Final agreement may come in the next few months.

The consortium is called the Metallurgical Equipment Export Co. It specializes in packaged steel-plant export deals.

CONCENTRICITY

MORGOIL

for the ultimate in rolling tolerance

New production methods and machining precision make possible a degree of bearing concentricity never before achieved. Extra care and accuracy in every step of manufacture give MORGOILS their ability to hold close rolling tolerances—under high loads and fastest speeds—with unmatched freedom from wear, fatigue and maintenance.

Seen through this 46" diameter Morgoil sleeve is the internal-external grinder specially designed for Morgoil manufacturing precision.

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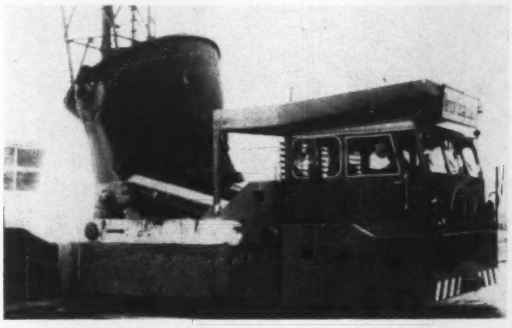
Slag Truck Totes 66 Tons

When you make steel faster, you get more slag too. Conventional lift trucks and rail-mounted slag cars are hard pressed to keep up with slag accumulations. From Germany comes a new approach to this problem. Faun Works of Nuremberg has developed a diesel-powered truck which carries 66 tons of slag. It moves forward or backward with its full load at speeds up to 13 mph. Controls face the driver in either direction.



SPECIAL TRUCK: Lifts huge slag pot.

Coal Fires Blast Furnace

The idea of injecting coal fines into blast furnaces has intrigued steelmakers for some time. Now, at least one mill is conducting large-scale tests with coal. Object is to reduce coke requirements. According to an authority on the subject, coal yields 1 million btu's for about 30¢. This source claims the same heat release costs 45-50¢ with natural gas and 56¢ with coke.

Aids Explosive Forming

Molten metal plays a dual role in explosive forming of asymmetrical tungsten-nozzle shapes, according to Aerojet-General Corp. Aluminum at 1800°F replaces water as the energy-transmitting medium. This melt also transfers heat.

Automation for Defense

Industrial specialists in military-procurement say automation pays off in production mobilization. For instance, automatic rifles were a trouble-some bottleneck, when tooled by job-lot methods. But procurement problems disappeared after mobilization planners set up pushbutton-production and automatic-assembly lines. Ordnance experts are also enthusiastic. They claim automation's the key to military strength in peacetime.

Tri-Color Heat Signals

With three distinct color wave lengths, a new pyrometer makes up to 1000 temperature checks per second in the 1000°-3000°C range. Accuracy of pyrometer itself is within 1 pct. However, highspeed readings also hinge on refinement of readout mediums. Depending on the need, oscilloscopes, magnetic tapes or other recording units can read pyrometer signals.

Pushbutton Lubricants

The nation's first lube-oil blending plant run by fully-automated electronic controls has recently been opened. This multi-million dollar facility blends and compounds more than 40 consumer and industrial oils for the Midwest market. The plant's central feature is an electronic console. With this control device, a technician can automatically mix as many as six additives at a time. One advantage claimed is fast delivery of lubricants made to precise specs.

ELECTRONIC CONSOLE: Blends lubricants.

Welds Metal to Ceramics

In a recent development program, electron-beam welding successfully joined pyrolitic graphite to tungsten. Both are promising heat-resistant materials. This same electron method also welds pieces of ceramic to molybdenum and tungsten.

Profit from the inside story on Roebling Royal Blue Wire Rope—the *quality* goes all the way through. Extra high strength in conjunction with uniformity of rope construction means unequalled resistance to wear and tear — and a whopping increase in service life. That is why every inch of Roebling Royal Blue pays off on the job for you. Get all the details from your wire rope distributor, or write for free booklet to Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

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Quality inside and outside

We put a lot of work into it – You get a lot of work out of it

Watching the "Touch of Gold" come to the surface

Operating a surface grinder equipped with segments of Norton 23 ALUNDUM* abrasive, this man sees production benefits taking actual form. High product quality is just one. Even more important is the free, fast cutting action that steps up both production rate and production economy.

This is how Norton grinding wheels bring the product-improving, cost-cutting "Touch of Gold" right to the surface of every grinding job — so every user can clearly see the advantages he's getting.

Watch "Touch of Gold" benefits taking place in your own plant. Your Norton Man, a trained abrasive specialist, or your Norton Distributor will gladly help you get proof. NORTON COMPANY, General Offices, Worcester 6, Massachusetts.

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Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Non-Slip Floors — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

Announcing... IRON AGE METALWORKING INTERNATIONAL

A NEW and completely DIFFERENT kind of publication! NOT just another United States business magazine extending its circulation into other countries, but a truly international, multi-lingual business publication for metalworking and metal-producing executives throughout the world.

First issue: January 1962.

EDITORIAL

● **Objective:** To provide a full international exchange of information relating to new developments and technology on metalworking processes, equipment and materials, as well as coverage of business and economic news.

● **Staff:** A full-time editorial staff in the United States and abroad will devote its entire efforts to the international publication, backed up by qualified correspondents in 18 metalworking centers throughout the world.

● **Content:** Editorial content and balance will be guided by continuing surveys of informational requirements and preferences among key executives in metalworking companies in the countries served. Full text editorial material will be in English, with digests in German, French and Spanish.

● **Format:** The new monthly publication is uniquely suitable for effective presentation and convenient reference, from the English full-text to the German, French and Spanish digests. Square format with publication trim size 11 x 11¼, four column makeup, will provide a 7 x 10 editorial page plus one column for a multi-lingual digest. This format will also accommodate a 7 x 10 advertisement plus multi-lingual digest of the copy. New product items will be keyed and a reader service postcard provided for new products as well as advertising.

THE READER

In most cases, the reader of IRON AGE METALWORKING INTERNATIONAL will be the chief technical executive of the metalworking plant. Typically, he will be responsible for both engineering and production and will have a key role in major purchasing decisions. In larger plants, where work is dispersed among a greater number of executives, IRON AGE METALWORKING INTERNATIONAL's readers will be in four basic functions: administration, engineering, production and purchasing.

CIRCULATION

Over 15,000 plants covering every market in proportion to its *immediate* potential, including—

The European Common Market
The Free Trade Association
The British Commonwealth
Central and South America
Japan, India, Africa
The Near East and Asia

Penetrates every segment of metalworking and metal-producing, including—

Ordnance
Metal Furniture
Primary Metals
Fabricated Metal Products
Machinery
Transportation Equipment
Instruments

AND FOR ADVERTISERS

● **Inquiry processing service:** All advertisements will be keyed — reader service card will be bound into IRON AGE METALWORKING INTERNATIONAL. Instructions on reader service card to be printed in four languages: English, German, French and Spanish. Postage to be paid by the inquiring reader.

● Marketing information.

● Copy translation assistance.

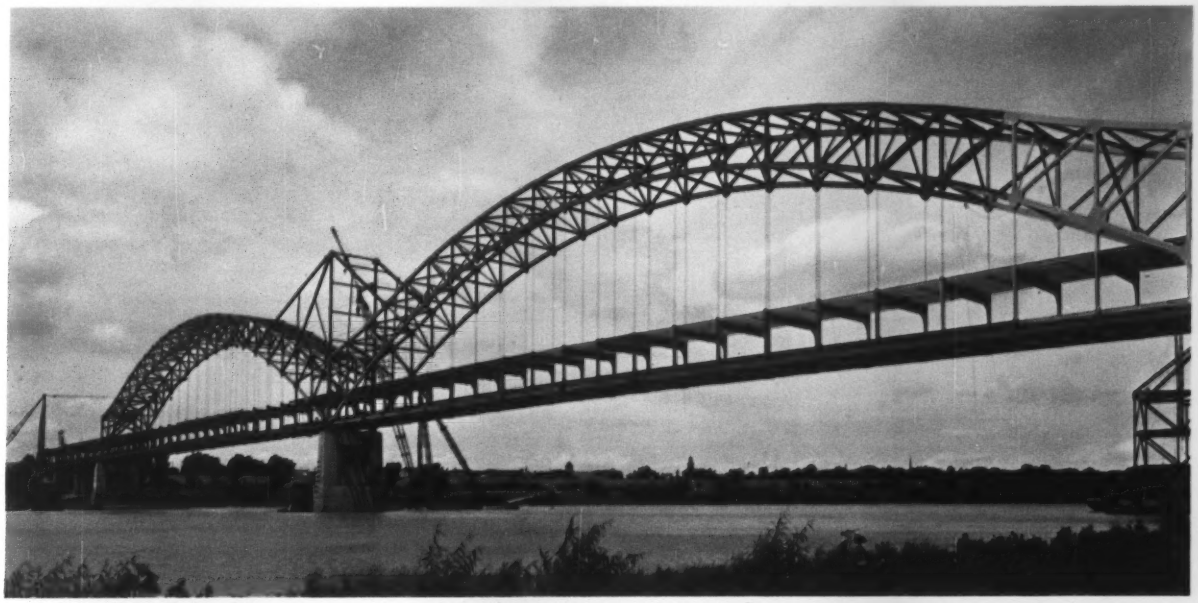
Your IRON AGE representative is ready to give you a preview, including full details and a pilot issue. Call him now.

IRON AGE METALWORKING INTERNATIONAL • a new chilton publication • 56th & chestnut sts. • phila. 39, pa.

DESIGN STEELS cut weight, save money in Louisville-New Albany Bridge

This mark tells you a product is made of modern, dependable Steel.

Louisville-New Albany Bridge was designed by Hazelet & Erdal, Consulting Engineers, Louisville, Kentucky, for the State Highway Department of Indiana and Kentucky Department of Highways. Fabricator: The R. C. Mahon Co., Detroit, Michigan. Erector: John F. Beasley Construction Co., Dallas, Texas (Sub-contractor to Mahon).



Scheduled for completion late in 1961 is this new double-deck, two-span, tied-arch bridge spanning the Ohio River between Louisville, Kentucky, and New Albany, Indiana. It is another fine example of the application of heat-treated constructional alloy steel, high-strength low-alloy and structural carbon steels to provide the desired strength at least weight and lowest cost. A total of 7,641 tons of steel was used in the two 800-foot spans and approaches.

Because much of this bridge was shop welded, the excellent welding properties of USS Design Steels played an important part in their selection. The weldable, constructional alloy USS "T-1" and high strength TRI-TEN Steels both permitted design engineers to reduce the amount of steel needed, resulting in a substantial reduction in the total cost. The reduction in dead weight enabled further savings by reduced loads on individual truss members, piers, and foundations.

All of the tie chords and most of the highly stressed upper and lower chords and some verticals were made of 100,000 psi yield strength heat-treated constructional alloy steel. Approximately 1,500 tons of USS "T-1" Steel were used.

Most of the diagonals, some of the top and bottom chords and approach trusses called for 50,000 psi high-strength low-alloy ASTM A242 steel. USS TRI-TEN Steel—1,535 tons of it—was used for these applications. (USS TRI-TEN Steel can also meet ASTM A441.)

United States Steel also furnished 1,100 tons of ASTM A373 and 1,550 tons of ASTM A7 structural carbon steel, used in the lesser stressed members of the bridge and approaches.

For more information on any of these USS Design Steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. USS, "T-1," COR-TEN, TRI-TEN, and MAN-TEN are registered trademarks

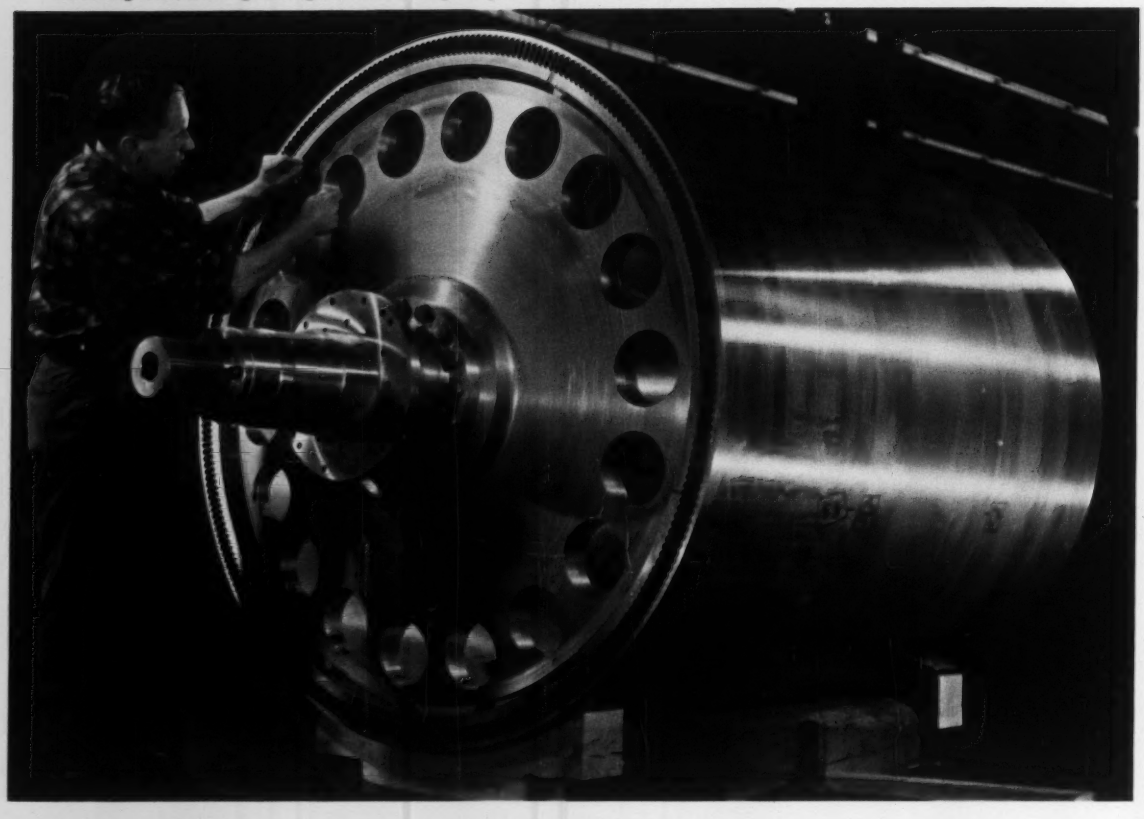
United States Steel Corporation • Columbia-Geneva Steel Division • National Tube Division • Tennessee Coal and Iron Division • United States Steel Supply Division United States Steel Export Company

USS Steels for bridge design

	PSI Min. yield
Structural Carbon Steel (A373)	32,000
Structural Carbon Steel (A7)	33,000
Structural Carbon Steel (A36)	36,000
USS COR-TEN High Strength Steel	50,000
USS MAN-TEN (A440) High Strength Steel	50,000
USS TRI-TEN (A441) High Strength Steel	50,000
USS "T-1" Constructional Alloy Steel	100,000
USS "T-1" Type A Constructional Alloy Steel	100,000

USS United States Steel

Rough-machined ring and forged ring being sawed at our Homestead Works.
Three-ring rotor, showing rectangular holes through ring wall, with end plates and tubular spindle assembled into a unit ready to ship.



How to bring a missile back through temperatures to 8,500°F

You can broil a steak at 350°F. Pure iron melts at 2795°F. Most meteorites burn up when they enter the earth's dense atmosphere. Today, man is firing missiles to meteoric altitudes—but the problems of tolerating the extreme temperatures of re-entry have been the greatest challenge to his ingenuity.

One of the major obstacles to simulating re-entry conditions was how to produce for realistic time durations pure air in large volumes at meaningful temperatures, pressures and velocities. This problem is being solved with the *Wave Superheater*—an innovation in hypersonic wind tunnels. Temperatures to 8500°F, pressures to 200 atmospheres and velocities up to Mach 15 can be attained with this facility. Cornell Aeronautical Laboratory has devised this equipment to test full-scale missile components in the laboratory.

The wave superheater is essentially a blow down system using a rotor with 288 tubes (passages) drilled into its periphery. The shock tubes are charged with air; then a driver gas (helium) at a pressure of 1500 psi is released through one end of each tube, successively superheating by shock waves the air which is then collected and expanded into the wind tunnel. The rotor operates at a maximum temperature of 800°F; each tube is momentarily cooled as it rotates, to be ready for the next charge.

Rotor Ring Forgings. The heart of the superheater is the rotor made from three USS Stainless W forgings. The rough-machined rings are each 63″ OD, 54″ ID, 23½″ long and weigh 6,000 pounds each. USS Stainless W was chosen for this demanding application because of its precipitation hardening characteristics, and its ability to retain the required high strength at the operating temperature.

The three rings were obtained from a 59″ diameter ingot, which was cogged, sheared, upset-forged, punched and finally mandrel-forged under our 10,000-ton press. After rough machining and completing the inspections called for, the rings were shipped to 20th Century Machine Tool Company, Utica, Michigan, who drilled and broached the holes seen in the assembled view of the three-ring rotor. With an assist by Hoover Tool & Die Company, Warren, Michigan, the final machining and assembly was completed in 10 months.

No matter what kind or size of USS Quality Forgings you need, you get the advantages of the finest steel, the most modern equipment and the most skilled forging men in the world. Address inquiries to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. A copy of our booklet "USS Nuclear Forgings" may be secured by writing to the same address. USS is a registered trademark.

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USS TRADEMARK **United States Steel**

55555-2

Send for new movie, "How to Weld USS 'T-1' Steels"

This new 18-minute, 16mm color motion picture shows concisely the practices involved in welding USS "T-1" Steels. If you are fabricating "T-1" Steel in your shop, this film and copies of the booklet will be a big help in demonstrating the proper technique to your welders. Fill out the coupon below and indicate the number of booklets you will need.

Included in the booklet is a handy welding heat-input calculator that helps a welder choose the proper welding machine settings. The film, together with the booklet, will help every welder to weld USS "T-1" Steels readily and successfully.

We'll gladly lend you the film and furnish enough free copies of the booklet and heat-input calculator for your shop personnel. USS and "T-1" are registered trademarks.

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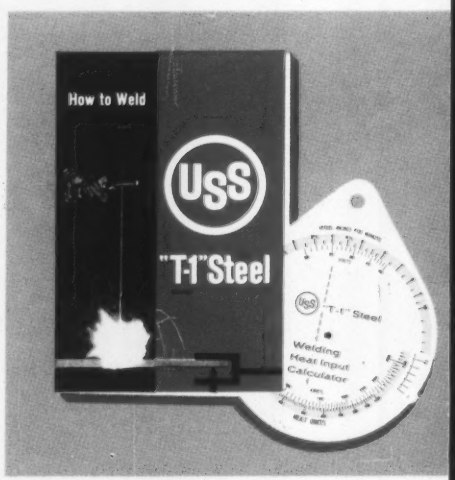


United States Steel

USS

United States Steel
525 William Penn Place
Pittsburgh 30, Pennsylvania

Gentlemen:

Please lend me your 16mm color, sound movie, "How to Weld USS 'T-1' Steels." Also, send me_____booklets of the same title. I understand there is no obligation.

Name_____

Title_____

Company_____

Address_____

City_____ **Zone**_____ **State**_____

On Productivity

■ The recent series of articles by R. N. McMurry and J. F. Sullivan on improving productivity continues to draw numerous letters to the editor. Some of these letters follow:—Ed.

Sir—I have just read "How to Improve Productivity; Why Some Attempts Fail" in your July 13 issue. I found the article contained many fallacies—fallacies that not only affect my company but saddle today's already overburdened executive with highly questionable information that could have an adverse effect.

The company I work for has been a solid success for over 35 years by furnishing employers with "various media of communication" that indeed did get the message across—on productivity and many other management headaches. I bitterly refute the authors' statement that "the approaches used by most companies to improve productivity not only fail but actually further alienate workers."

The fact that this article is "An IRON AGE Special Report to Management" and a three-part series makes me firm in my belief you are rendering a disservice to management.

The illustration appearing on p. 68 of the July 13 issue, and the accompanying caption, is, in my opinion, an attack on the intelligence of both management and the worker.

I sincerely hope that you will give us the privilege of answering this unwarranted attack on our industry.—Robert J. Burns, The Sheldon-Claire Co., Chicago.

Sir—Brief, penetrating and exact are the words that would best describe the fine piece of literary consultation contributed by Mr. McMurry and Mr. Sullivan on improving productivity. Their message strikes close to my own thesis which long has been that the so-called "modern" methods of management are not unlike the "modern" psychological methods of raising children. They're widely used, little understood and, therefore, grossly misapplied.

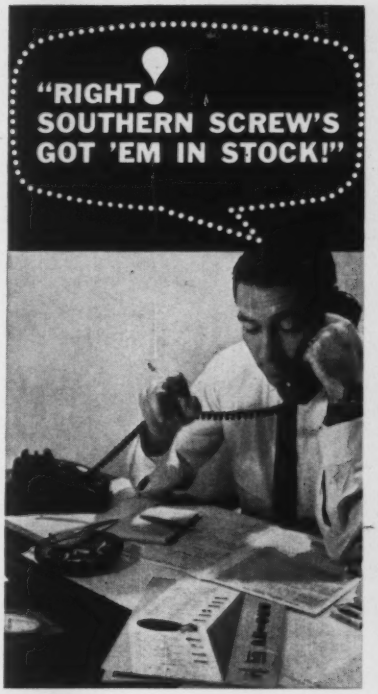
One of management's greatest errors was that of removing the "status lines" between the foreman and the worker. Actually, we are guilty of human relations without understanding.

My thanks to these two fine scholars for their fine analysis.—Frank L. Husted, Anaconda American Brass Co., Buffalo, N. Y.

Sir—This is one of the best and most instructive series I have read in many years. It is factual, down-to-earth, and deals with the basic fundamentals of the problem. I think the authors, R. N. McMurry and J. F. Sullivan, have turned in a real outstanding job. We need more information and articles similar to this series.—D. K. Archer, National Gypsum Co., Buffalo, N. Y.

Sir—This series was one of the best I have read recently. Many thanks to Mr. McMurry and Mr. Sullivan for a job well done.—Robert F. Stahl, Jr., Ballastran Div., Telex, Inc., Fort Wayne, Ind.

"Baxter, I understand you'll do anything for money. How about some work?"

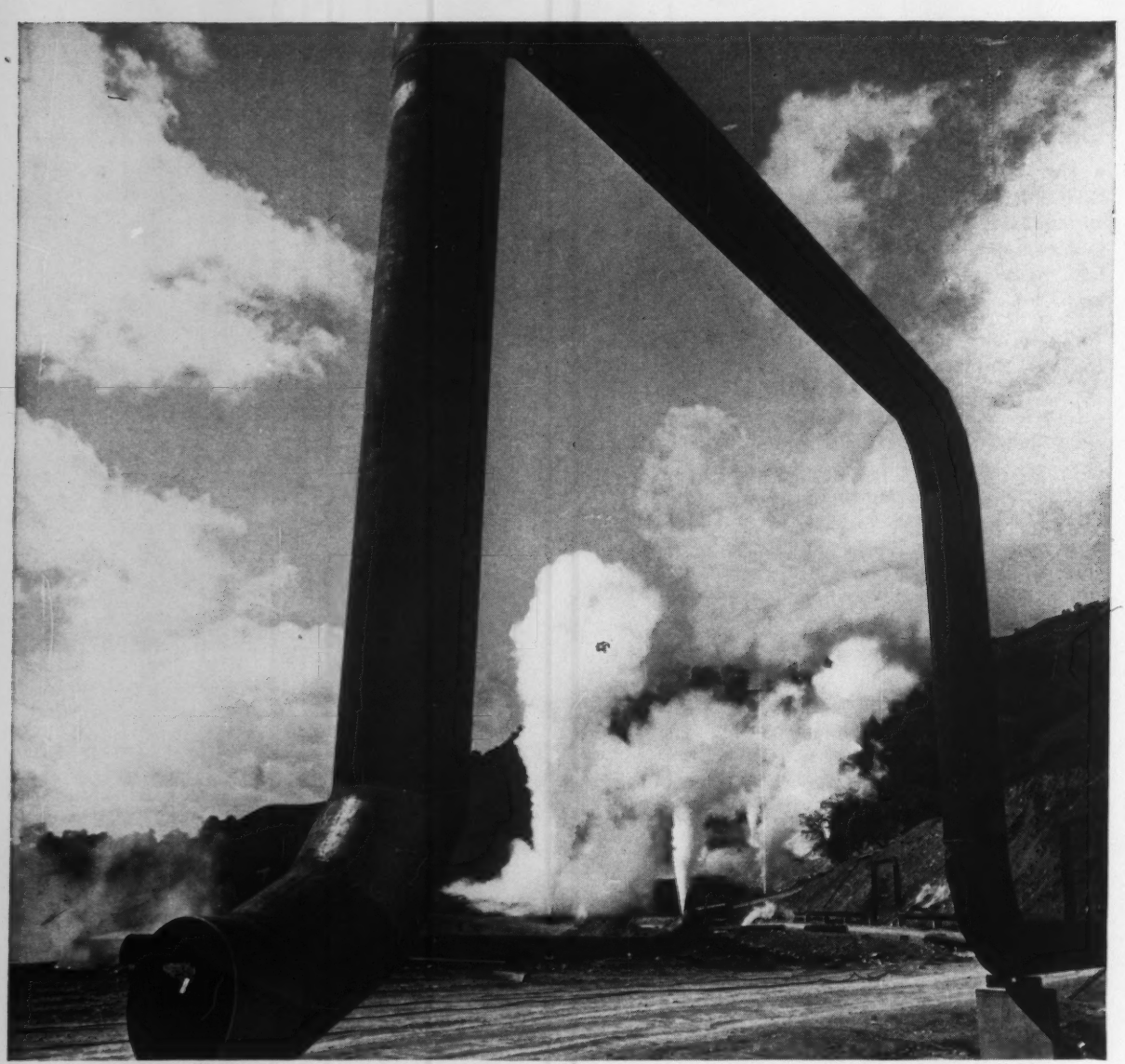


What Ft. Knox is to gold, Southern Screw is to fasteners. Southern's Statesville stock carries over 1,500,000,000 pieces of 100% USA-made quality fasteners. Warehouses in New York, Chicago, Dallas and Los Angeles, plus a nation-wide network of wide-awake Southern distributors, means that you can use the local source for Southern fasteners as your stockroom.

Now's the time to make Southern fasteners an economy factor in faster assembly and a quality factor in your products. Contact your Southern supplier, or write or wire now for current Stock List. Address: Southern Screw Co., P. O. Box 1360, Statesville, N. C.

Machine Screws & Nuts • Types A, B, C, & F Tapping Screws • Stove Bolts • Drive Screws • Hanger Bolts • Wood Screws • Carriage Bolts • Continuous Threaded Studs • Speaker Screws

Southern SCREW COMPANY
STATESVILLE • NORTH CAROLINA



These "geysers" actually consist of steam rocketing up from deep in the ground. From this well area, operated by Magma and Thermal Power Companies, steam is conducted by pipeline to The Geysers Power Plant a quarter-mile away.

Now...electric power from geysers!

Nickel in stainless steel helps make possible America's first geothermal power plant.

Here's a power plant under construction in California that will produce enough electricity for a town of 50,000 people—all from the steam of geysers.

To withstand the continuous attack of this highly corrosive steam at The Geysers Power Plant, Pacific Gas and Electric Company selected stainless steel with nickel for all points where condensed steam contacts metal.

With nickel in it, stainless steel is more than a match for this corrosive steam. This ability plays a key role in turning out power every day of the year, with virtually no maintenance in a plant designed for unattended operation.

Nickel helps metals and alloys withstand the severest conditions. Nickel-containing metals safely hold liquid oxygen at a sub-zero cold that shatters many materials. America's first nuclear-powered merchant ship uses alloys with nickel in them to contain the tremendous pressures and corrosive conditions in its power plant. And an alloy with nickel in it will enable the famous X-15 rocket ship to make the hot ride home from space without burning up.

Does your company have problems of these kinds in a product or a process? Why not write to us about them. Perhaps nickel or one of its alloys can help you.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street INCO New York 5, N. Y.

INCO NICKEL

NICKEL MAKES STEEL PERFORM BETTER LONGER

All About Controls

Tremendous interest, but not too much done about it. That just about sums up the reaction during the past years whenever numerical controls and machine tools are mentioned in the same breath.

Did you ever get close to a demonstration of the combined technique at one of the trade shows? If you did, there were probably six or seven elbows in your stomach.

Wonderful, But—You returned to the plant and told your boss all about this metalworking marvel. Then management adopted a conservative skepticism. They talked about the high cost of the package or the complexity of the electronics or unfavorable government write-off policies. "Let's wait a few years until so-and-so comes out with their new controls," may have been the decision.

This long period of waiting may be over. The builders of controls have taken some giant strides recently. And the economic picture is changing at a fast rate.

Rising Tide—To get the inside story, Machinery Editor Ralph Eshelman interviewed some of the top authorities in the electronics and machine tool fields. Ralph noted a sincere wave of optimism which is expected to result in a new assault on the metalworking market.

What's behind this new tide? How will industry benefit from it? You'll find these answers along with many others in Ralph's exclusive story beginning on p. 85 in this issue.

Hair's Breadth

Tolerances — industry's allowances for error or deviation in measurement—are becoming almost intolerant.

We realized this all the more after reading some facts and figures supplied by Aerojet-General Corp.

Hair-Splitting — First Aerojet points out the common household yardstick can be as much as a tenth of an inch off the true length established by the National Bureau of Standards.

In hair-splitter terms, this tenth of an inch would equal 30 human hairs laid side by side.

However at Aerojet's Measurement Standards Laboratory, accuracy can be held within one millionth of an inch. This, again thinking in hair-splitting terms, means slicing one human hair lengthwise into 300 slivers. One of the slivers represents the measure of this accuracy.

And Weighing—Another example is in weight.

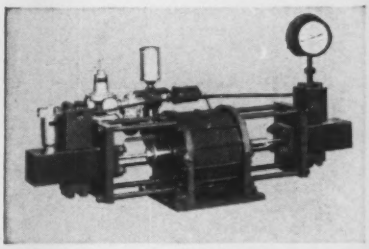
Aerojet's accuracy of weighing is 0.00000035 of an ounce. This is one three-millionth of an ounce—or smaller and lighter than a speck of dust.

Bid for Business

An auto repair shop, not far from DeWitt, New York, has a sign in the window reading, "May We Have the Next Dents, Please?" Word on this comes to us via the publication Surburbia Today.

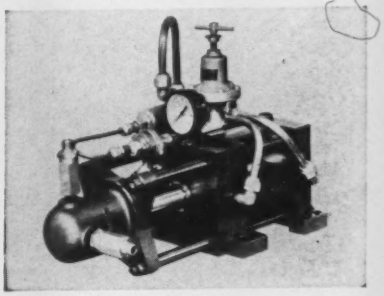
"Old Mike is pretty clever—he can repair almost everything he breaks."

Need reliable hydrostatic testing to 50,000 psi?



Ordinary pumps just won't do. To handle fluids at pressures up to 50,000 psi and beyond, it takes the rugged dependability of an Aldrich heavy-duty, 6″ stroke pump. Powerful yet compact, this unit is the right answer for high pressure equipment on production lines or in the laboratory.

Service—hydrostatic testing of tubing, valves, pressure vessels; operation of hydraulic presses, cylinders, valve positioners. Available single or double acting.



For intermittent service and pressures to 36,500 psi, the Aldrich 3″ stroke pump is ideal, offers low first cost, high reliability.

Both these Aldrich Air-Driven Hydraulic Pumps operate on normal plant air, are readily installed and economical to run. Immediate shipment from factory stock. Write for Data Sheet No. 36 (6″ stroke) and No. 36A (3″ stroke). Aldrich Pump Company, 8 Pine St., Allentown, Pa.

ALDRICH
SUBSIDIARY OF INGERSOLL-RAND

Where maximum cleanliness is a "must"... EXLO® "75" Extra high in chromium and extra low in carbon, EXLO "75" is specially designed for use in very low-carbon stainless steels and heat-resistant alloys. There are two grades to choose from—.015% max. carbon and .025% max. carbon—both of which contain a minimum of 75% chromium. Because of its exceptional cleanliness, EXLO "75" is particularly adaptable to vacuum melting and other processes requiring minimum contaminant elements.

And don't forget the EXLO Standard Grades for use in low-carbon stainless and heat-resistant steels, irons and alloys. Like all EXLO ferrochromium alloys, they have high density and maximum cleanliness. Write for information or call your nearest VCA District Office. Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N.Y. · Chicago · Cleveland · Detroit · Pittsburgh.

VANADIUM CORPORATION OF AMERICA

Producers of alloys, metals and chemicals

COMING EXHIBITS

National Chemical Show—Sept. 5-8, International Amphitheatre, Chicago. (Chicago Section, American Chemical Society, 86 E. Randolph St., Chicago 1.)

Heavy-Duty Vehicle & Engineering Display—Sept. 11-14, Milwaukee Auditorium. (Society of Automotive Engineers, Inc.)

Instrument - Automation Exhibit—Sept. 11-15, Memorial Sports Arena, Los Angeles. (Instrument Society of America.)

Industrial Building Exposition—Sept. 25-28, New York Coliseum.

Fleet Maintenance Exposition—Oct. 23-26, New York Coliseum.

Metal Show—October 23-27, Cobo Hall, American Society for Metals, Novelty Park, O.

Marine Supplies & Equipment Show—Nov. 15-17, Hotel Roosevelt, New York City.

MEETINGS

September

Aluminum Extruders Council Conference — Fall meeting, Sept. 6-8, Sheraton-Cadillac Hotel, Detroit.

National Assn. Secondary Material Industries—New England Div. meeting, Sept. 7, Sheraton-Plaza Hotel, Boston, Mass. Assn. headquarters, 271 Madison Ave., New York 16.

Air Moving and Conditioning Assn., Inc.—Annual meeting, Sept. 10-14, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, Guardian Bldg., Detroit.

Society of Automotive Engineers, Inc.—"Heavy-Duty" vehicle meeting, Sept. 11-14, Milwaukee Auditorium. Society headquarters, 485 Lexington Ave., New York 17.

Instrument Society of America—16th annual instrument-automation conference, Sept. 11-15, Biltmore Hotel, Los Angeles.

(Continued on P. 28)

NOW!

Portland, Oregon Bulk Unloader Ready to Slash Import Costs

Portland Public Docks proudly announces completion of its giant new straight-line bulk unloader and pier—the only plant of its kind on the Pacific Coast! With a rated-capacity of 900 tons-an-hour, this facility cuts the heart out of dry bulk importing costs and puts the savings in your pocket.

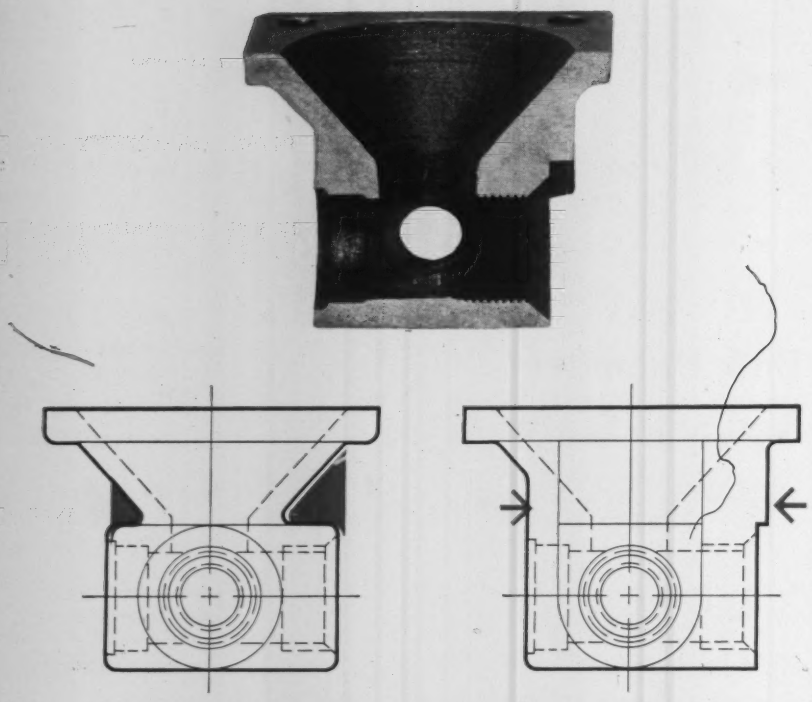
- direct transfer from ship to rail or truck
- 140-car rail yard
- open storage area
- cargo shed
- will handle all types of vessels . . . all types of dry bulk cargoes

Specially designed to create savings for importers of ores, ore concentrates, chemicals, salts, feeds and all dry bulk cargoes.

FOR COMPLETE INFORMATION CONTACT:
SALES-TRAFFIC DEPARTMENT

PORTLAND
PUBLIC DOCKS

Operated by the Commission of Public Docks
3070 N.W. Front Ave. Portland 10, Oregon
CA 8-8231 Cable (DOCOM) TWX PD309U
EASTERN REPRESENTATIVE: Buckley & Co., 170 Broadway, New York 38, N.Y.



REDESIGN CUT COSTS

A CASE IN POINT—Hamilton Foundry engineers suggested a single design change which saved over 50% in pattern costs and cut the unit price 28% on the quantities ordered.

Curtis Automotive Devices, Inc. uses this casting on their DYNA-FOG® Insecticide Applicator. As initially designed, the part had an undercut which required cores in the mold. Hamilton Foundry's engineers suggested a simplified design which eliminated the cores and made dramatic savings possible in tooling costs and unit prices. You can expect this kind of engineering assistance from Hamilton Foundry.

When buying castings, the skill and integrity of Hamilton Foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY INC.

1551 LINCOLN AVENUE • HAMILTON, OHIO • TWinbrook 5-7491

MEETINGS

(Continued from P. 27)

Non - Ferrous Founders Society—Annual meeting, Sept. 17-21, Shawnee Inn, Shawnee-on-the-Delaware, Pa. Society headquarters, University Bldg., 1604 Chicago Ave., Evanston, Ill.

AEC Welding Forum — Annual meeting (classified), Sept. 20-22, Southwest Research Institute. Institute headquarters, Granada Hotel, San Antonio, Texas.

Industrial Electronics Symposium — Sept. 21-22, Bradford Hotel, Boston. Institute headquarters, 51 East 42nd Street, New York 17.

Pressed Metal Institute — Annual meeting, Sept. 24-28, The Grand Hotel, Point Clear, Ala. Institute headquarters, 3673 Lee Rd., Cleveland.

American Welding Society — Fall meeting, Sept. 25-28, Adolphus Hotel, Dallas, Texas. Society headquarters, 33 W. 29th St., New York.

Assn. of Iron and Steel Engineers —Annual convention, Sept. 25-28, Penn - Sheraton Hotel, Pittsburgh. Assn. headquarters, 1010 Empire Bldg., Pittsburgh.

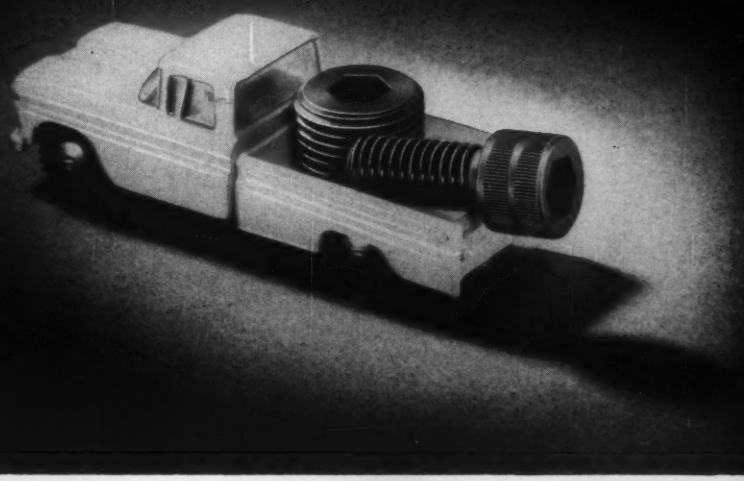
Steel Founders' Society of America —Annual Meeting, September 25-26, The Homestead, Hot Springs, Virginia.

American Die Casting Institute Inc. and The Die Casting Research Foundation—Annual meeting, Sept. 27-28, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

American Production and Inventory Control Society—Annual national conference and technical exhibit, Sept. 28-29, Pick-Congress Hotel, Chicago. Society headquarters, 330 S. Wells St., Chicago 6.

Purchasing Agents Assn. — 14th Pacific Inter-Mountain Conference, Sept. 29-30, Westward Ho Hotel, Phoenix, Arizona.

Think Delivery . . .



HOLO-KROME'S SAME-DAY SERVICE ON THERMO-FORGED SOCKET SCREWS PREVENTS DOWNTIME ON YOUR PRODUCTION LINE*

Downtime costs profit dollars . . . that's why you've got to be sure the fasteners you vitally need arrive at your plant *on time*. And that's why Holo-Krome's Same-Day Service is so important to you. Packaged goods shipped *same day the order comes in*—most specials shipped in four weeks or less!

For profit-making quality and on-time delivery, standardize on Holo-Krome THERMO-FORGED socket screws. See your authorized Holo-Krome distributor or write for more information.

HOLO-KROME
Thermo-Forged*
SOCKET SCREWS

SOLD ONLY THROUGH AUTHORIZED HOLO-KROME DISTRIBUTORS
THE HOLO-KROME SCREW CORPORATION • HARTFORD 10, CONN.

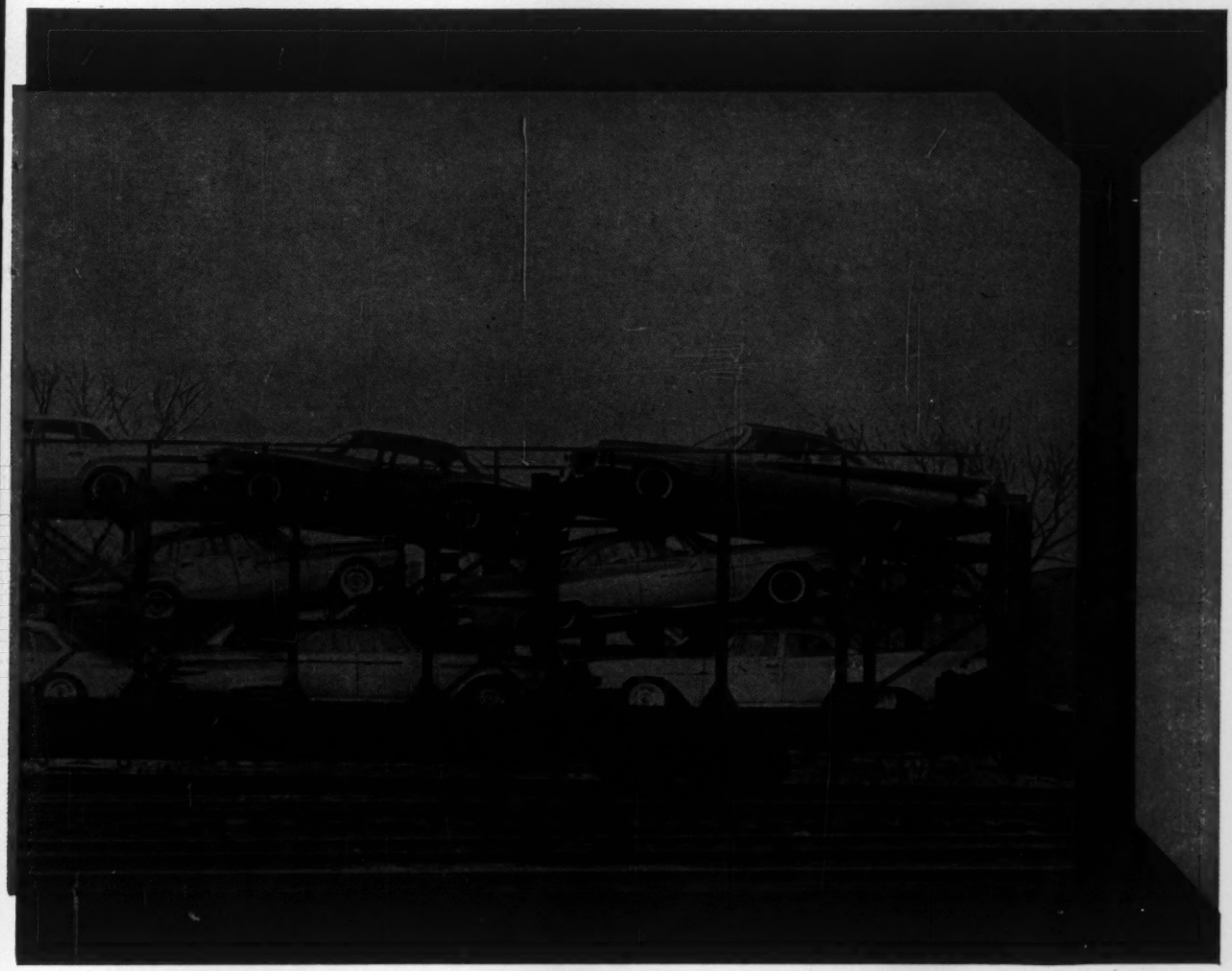
**Trade Mark of The Holo-Krome Screw Corporation*

GLX-W COLUMBIUM-TREATED CARBON STEEL CUTS DEAD WEIGHT 10% IN NEW

VERSATILITY...
That's the Beauty of Steel

Bringing important new economies to rail shipment of automobiles, this new tri-level auto carrier holds twelve standard cars or mixed loads of 14 standards and compacts. Capacity is increased up to 75%. A unique system of hydraulically positioning the vehicles on three levels gives a clearance of only 16 feet 8 inches, permits use in areas formerly limited to bi-level unit operation because of clearance requirements. ◆ Key feature of the Multi-Car Carrier is the movable decks on which the cars ride. Made of GLX-W columbium-treated steel, the decks are raised and lowered by built-in hydraulic lifts, actuated by a portable power unit. Here light weight was essential, in order to reduce the operating power requirements. Yet great strength was necessary, too, to support the payload. Finally, design of the decks called for eight bends in each section. So formability was also a must. ◆ GLX-W met and exceeded all these requirements. It gives 50-100% greater strength than mild carbon steel, so builder Whitehead and Kales could get the required strength with less weight. Deck operating units need less power,

Great Lakes Steel is a Division of



Multi-Car Carrier built by Whitehead and Kales for Multi-Car Corporation, Detroit, Michigan

TRI-LEVEL AUTO CARRIER

and total weight is reduced approximately 5,000 pounds or 10%. Production is more economical, too, because the ductility and formability of GLX-W permits four of the bends in the deck to be performed in one press operation. ◆ The GLX-W series of high-strength steels consists of fine-grained, semi-killed mild carbon steels, treated with varying amounts of columbium. The high strength of GLX-W permits designers to reduce the amount of steel and effect considerable cost savings when replacing mild carbon steel. GLX-W steels have a low carbon content and are readily weldable and formable. GLX-W steels are available at four minimum yield strength levels: 45,000, 50,000, 55,000 and 60,000 p.s.i. and in sheets, plates and bars. For complete technical information, write Great Lakes Steel Corporation, Product Development, Dept. IA-9, P. O. Box 7310, Detroit 2, Michigan.

NATIONAL STEEL CORPORATION

GLX W PATENT PENDING

A PRODUCT OF

GREAT LAKES STEEL

Detroit 2, Michigan

Best rest comes from wire spring coils—hundreds of them laced together in an innerspring mattress unit like this at Kay Manufactur[illegible] Corporation's High Point, N. C., plant. Pittsburgh Steel supplies Kay with 8-15½ gage upholstery spring wire for innersprings and high tensile wire for exclusive Kay-Arc sinuous springs for furniture.

PITTSBURGH STEEL UPHOLSTERY WIRE HELPS PUT THE "ZZzzzz" IN KAY SLEEP PRODUCTS

To assure restful comfort to the people who use his products, there's no rest for a manufacturer of innersprings.

Because he's dealing with one of the most basic human wants—personal comfort—the innerspring producer dare not be caught napping on product quality. But he can take comfort in Pittsburgh Steel Company's high carbon wire.

Kay Manufacturing Corp. of Brooklyn, N.Y., does—as do many other spring manufacturers.

One of the largest suppliers of springs and other components to bedding and furniture manufacturers, Kay depends on Pittsburgh Steel for substantial quantities of automatic knotting and coiling quality upholstery spring wire, and high tensile wire for sinuous furniture springs.

Why? Because Kay knows it can count on Pittsburgh Steel for high carbon wire with the consistency of size, tensile strength, ductility, toughness and soundness that form the starting point for innerspring superiority.

Plant Manager Martin Tuska of Kay's High Point, N.C., plant explains:

"To produce innerspring units with uniform characteristics, it's absolutely necessary that the wire forms and sets into springs that are identical in height, pressure, diameter and pitch.

"The wire can't have any hard or soft spots. We double wrap knots over the second turn on one or both ends of the coil. That takes high carbon wire with high, uniform ductility because the wire is twisted twice around its own diameter.

● **Needs toughness**—"It has to have special toughness, too. That is, it must have the strength and ductility to be compressed countless times without showing fatigue—to provide the deep, unchanging resiliency that only an innerspring can give.

"I'd say that the quality and performance of Pittsburgh Steel's high carbon wire, from coil to coil, is very good."

Using upholstery spring wire from 8 to 15½ gage, Kay's High Point plant produces several hundred assembled innerspring units per day for many of the country's largest manufacturers of mattresses, dual-purpose sleep equipment and furniture.

Featuring the highest degree of

Compressed 2 inches, 5-turn innerspring of Pittsburgh Steel upholstery wire must respond with pressure reading of 6½ pounds; must hold height within ⅛-inch after stress relief.

Uniformity of Pittsburgh Steel wire assures long production runs on coiling and knotting equipment. Five-inch, five-turn coils are held to ½-inch tolerance in pitch and diameter.

Ductility and tensile strength of wire get their toughest test during knotting. Kay double-knots innersprings, automatically twisting wire twice around its own diameter.

uniformity, units are assembled on automatic lacing machines in all standard sizes and coil counts from springs that are individually stress relieved immediately after coiling.

Through a quality control system based on programmed inspections, as well as spot checks, Kay maintains identical product uniformity through all seven production plants from coast to coast.

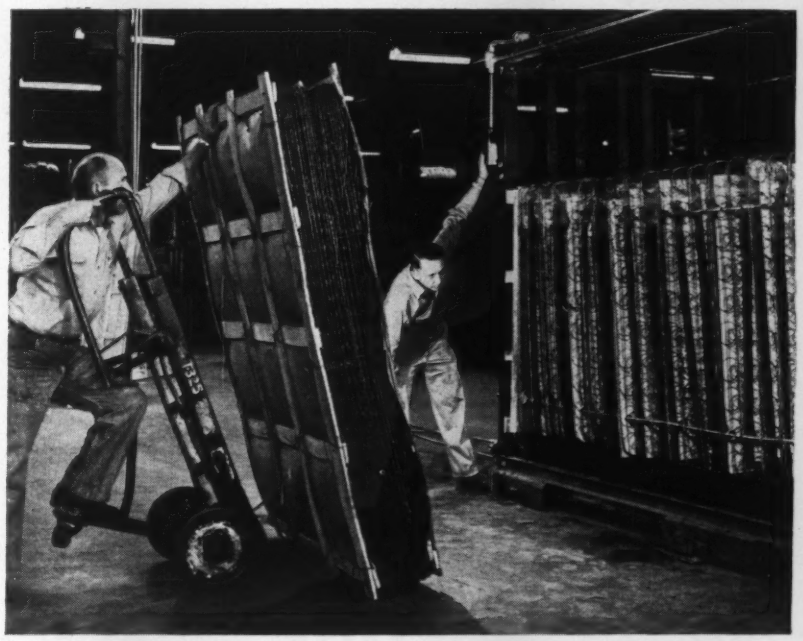
By making extra efforts to assure its customers a product of highest quality, Kay provides further proof of the superiority of innerspring bedding and furniture.

Steel spring construction, unlike slab-type bedding and furniture, offers the manufacturer-assembler versatility and wide flexibility in:

- **Design of finished product.**
- **Control of resiliency, density and degree of comfort.**
- **Selection of special finishing materials and components.**
- **Promotional features for attracting retail buyers.**

If you're a bedding and/or furniture manufacturer, take advantage of these benefits. They're available only with innersprings.

Or, if you're a bedding and furniture spring manufacturer, take advantage of the benefits inherent in Pittsburgh Steel Company's high carbon wires. The same experience in producing wire for special applications that helps Kay Manufacturing Corp. is available to you, too, from Pittsburgh Steel. Just contact one of the offices listed at the right.



Twenty completed innerspring units compress into a bale 11 inches thick—little more than twice the thickness of a single unit. Baling reduces bulk in shipping yet units retain full depth, resiliency when unpacked.

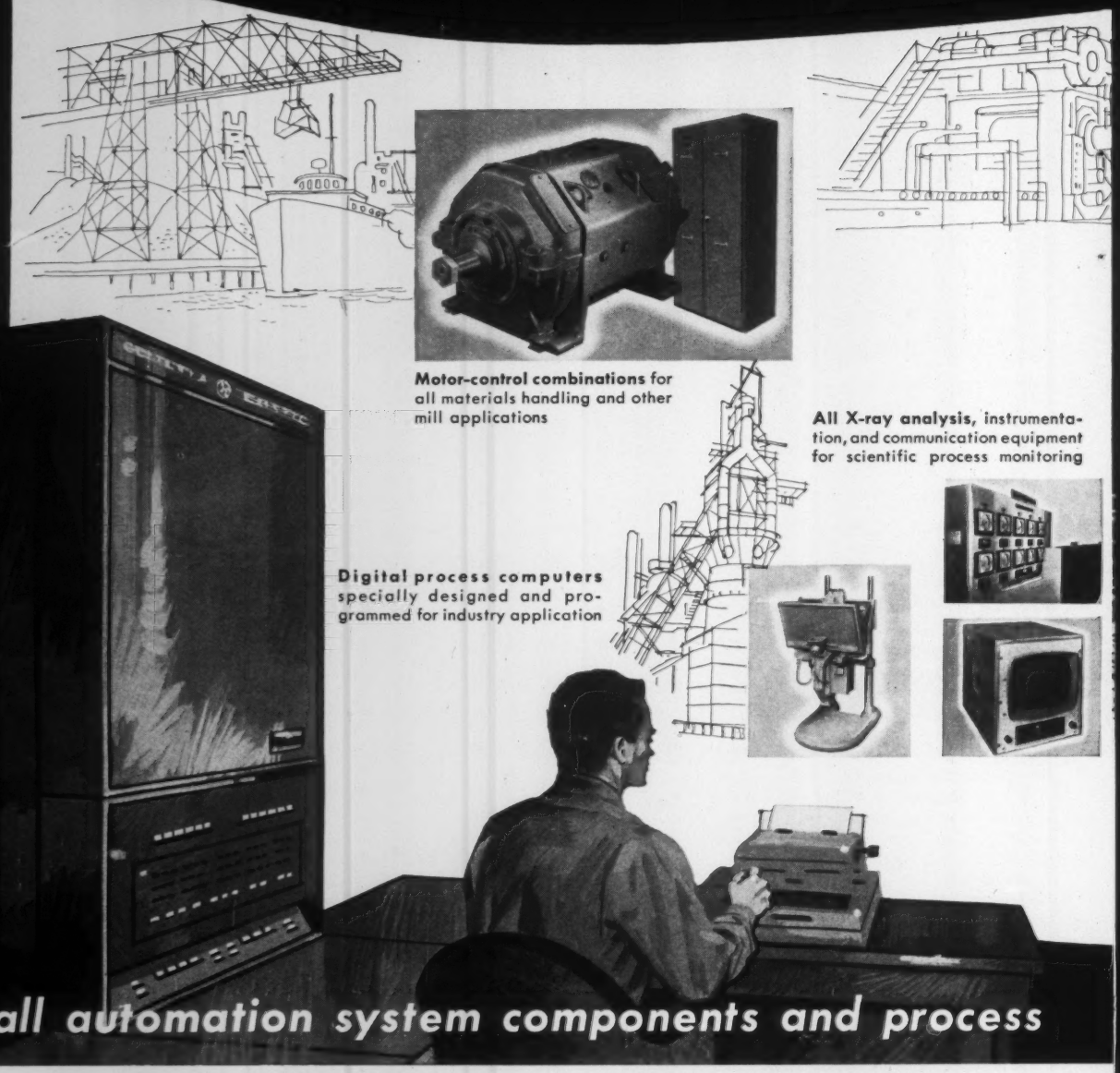
Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

LEADERSHIP IN
INDUSTRIAL AUTOMATION



Motor-control combinations for all materials handling and other mill applications

All X-ray analysis, instrumentation, and communication equipment for scientific process monitoring

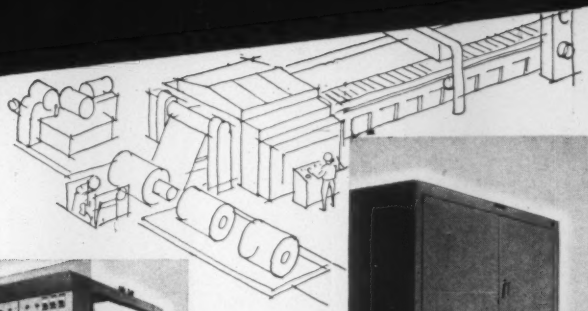
Digital process computers specially designed and programmed for industry application

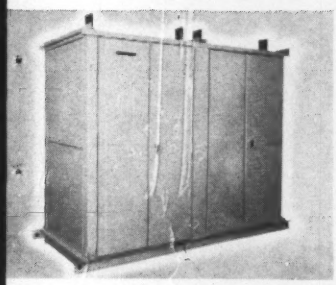
For all automation system components and process

your BEST SOURCE is ONE SOURCE...

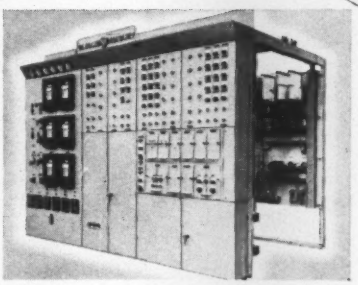
Whether your plans call for automation of one process or integrated automation of your whole business, a broad panorama of General Electric system components and process know-how provides you with the best single source of assurance that all automation goals will be realized. For, only a *one-source supplier* of all system components and engineering can assure you that all components have been designed to work together for maximum system efficiency and reliability.

General Electric is this one-source supplier. No other single source provides such a complete array of basic production system components such as motors, generators, and controls; along with all necessary instrumentation, sensing, data logging, and computing equipment—"the brains" of the automation system. And these components are proving themselves on-the-line, every day, in virtually every metal producing process from ore handling to finishing.

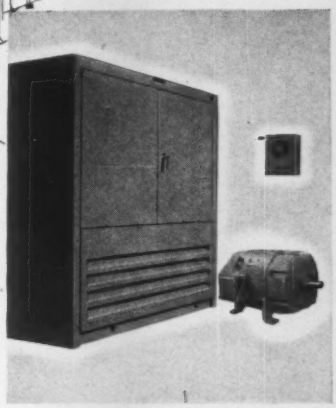




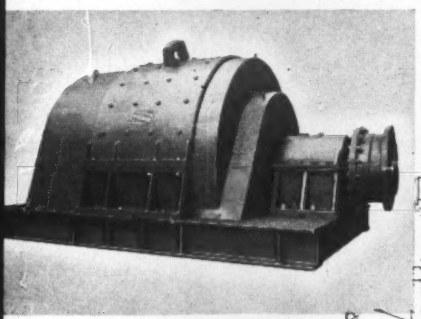
Rectifier power supplies or motor-generator sets for all mill d-c power requirements



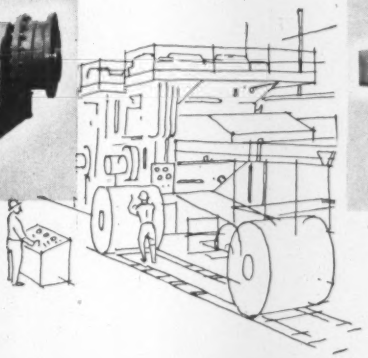
Controls for all main and auxiliary metal rolling mill and processing line applications

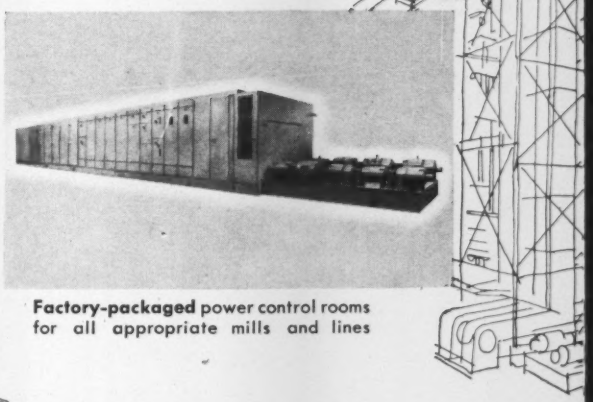


Packaged adjustable-speed drives for all appropriate process and finishing line applications



Large d-c motors for any main mill-drive application





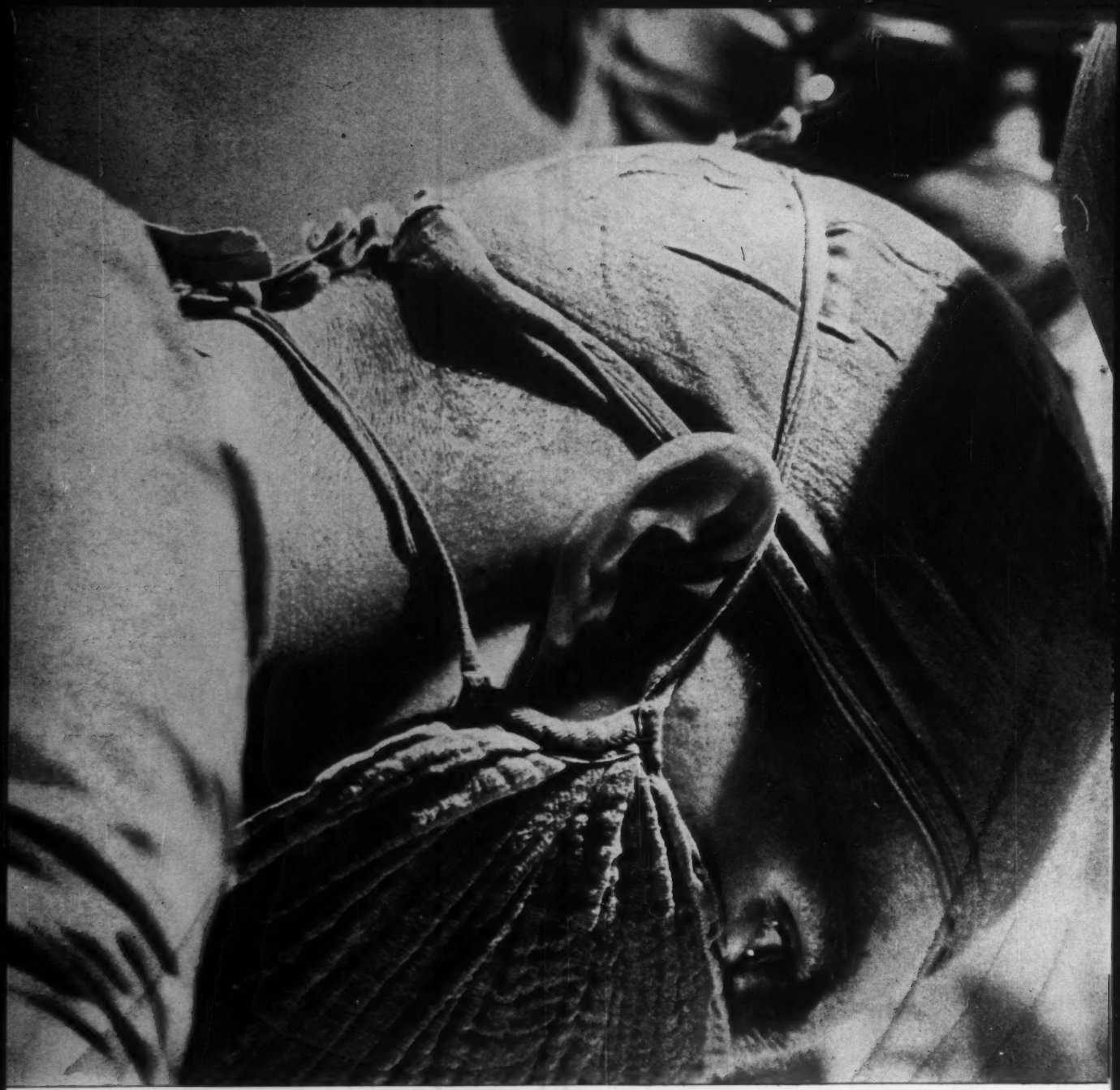
Factory-packaged power control rooms for all appropriate mills and lines

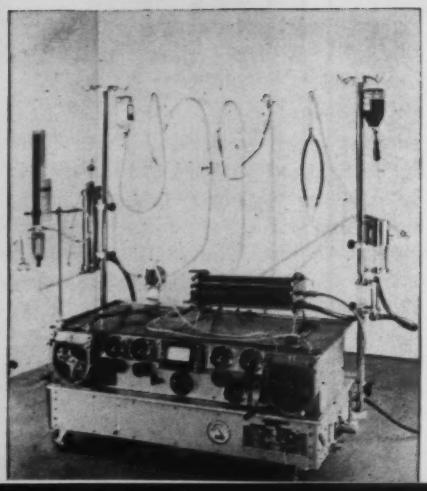
know-how...

...GENERAL ELECTRIC

General Electric automation of these processes is developed according to *your* process needs. Our system engineers have, for years, worked closely with your industry to gain a thorough understanding of all processes, their interrelationships, and the inherent problems encountered in their automation. Thus you can be assured of an approach to automation that has, as its basis, sound knowledge and understanding of the *total* job to be done. No other single source can supply this much process know-how. It covers your entire production picture, from customer order to finished product. And it will pay you dividends, whether for automation of a single process or your entire plant. For complete information contact your nearest General Electric Sales Engineer or write to General Electric Company, Section 659-08, Schenectady 5, New York.

GENERAL ELECTRIC





Heart surgery is always a matter of life and death.

The people who perform these operations and the equipment they use must work flawlessly. When they open the heart, it stops supplying blood to the body. So, they use an artificial heart and lung machine that pumps out the blood, keeps it at body temperature, removes carbon dioxide, adds oxygen and then returns it to the patient. This machine must not fail!

The design, construction and materials of the artificial heart and lung machine are the very best man can devise. Pemco, Inc. uses USS National Seamless Steel Tubing (Type 304 Stainless) for pump fittings, blood handling connectors and vessels.

For tubing that can meet the most critical requirements, ask for USS National Seamless Steel Tubing. National Tube Division, U. S. Steel, 525 William Penn Place, Pittsburgh 30, Pa.

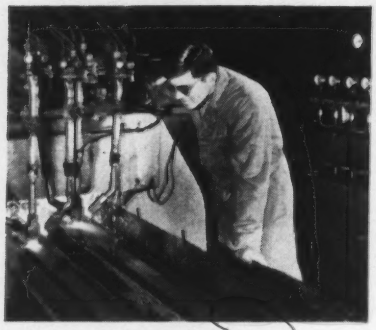
USS and National are registered trademarks

This mark tells you a product is made of modern, dependable Steel.

National Tube Division of United States Steel

Columbia-Geneva Steel Division, San Francisco Pacific Coast Distributors
United States Steel Supply Division
United States Steel Export Company, New York

Over 38,000 Monarch Lathe Beds can't be wrong

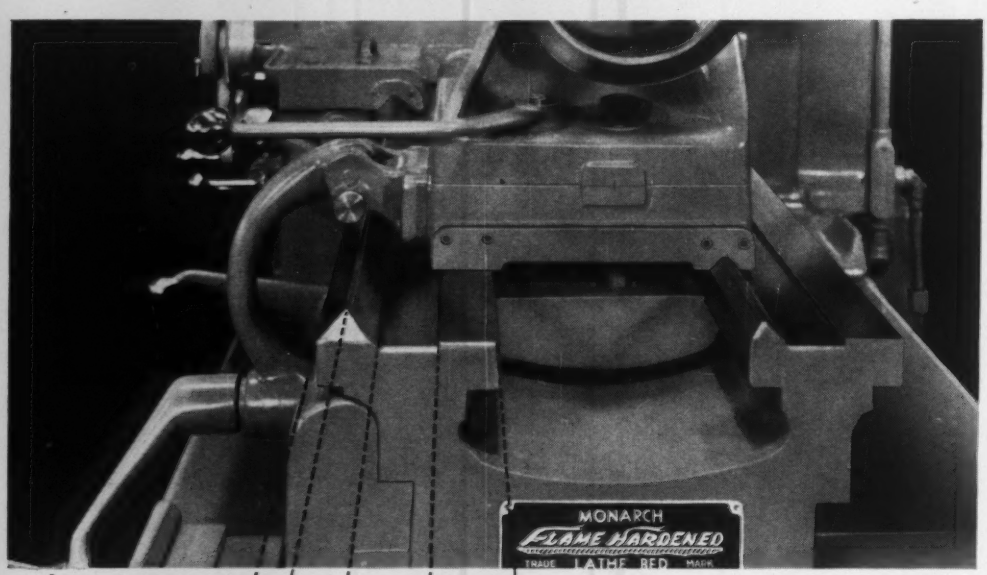


You never saw this flame hardening procedure until Monarch perfected it. But for many years, it has produced one-piece lathe beds without equal for sustained hard use, with retained original "factory fresh" accuracy.

Unique advantages over nonhomogeneous types of bed construction include: *complete rigidity* — no elastic members which cannot be kept straight; *even thermal expansion* — no uneven bending due to several different coefficients of expansion; *all four bed ways flame hardened* — only when all the ways are hardened is permanent alignment of tailstock and carriage assured. Having ways integral with the bed itself, *vibration damping* is unequaled, the precision ground way surface *accuracy stays put* and *no replacements ever* are required due to way separation from the machine base.

Flame hardening of lathe beds is not an easy-to-come-about nor simple technique. It requires (1) selection of the most ideal material analysis for the job; (2) necessary knowledge and experience with respect to processing and machining for optimum results, and (3) facilities to do the job right.

Monarch applies this process to all models and sizes. Flame hardening is just one of the many examples of where the extra values come from when you use lathes made by THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO.



Monarch Flame Hardened Beds. One-piece • Dense, wear-resistant chromium-alloy cast iron • Ground to a .0005" over-all tolerance • Over 38,000 in use.

Monarch
TURNING MACHINES

ASK ABOUT THE MONARCH
DEFERRED PAYMENT AND TOOL LEASE PLANS

Lower Your Machining Costs With This Remarkable Tool

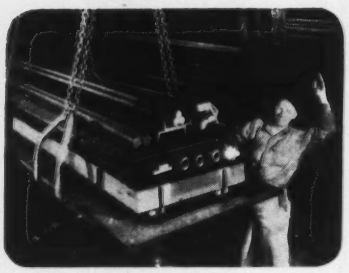
Simply by penciling in a specification for FERROCARBO-treated iron when you order gray-iron castings, you can realize large-scale savings in machining costs. The increased surface machinability of FERROCARBO-treated irons, by independent laboratory test, is 31 to 63 percent. This makes possible savings in the machining of castings that may easily exceed their original cost.

For faster machining, longer tool life and decreased down-time, always specify FERROCARBO-treated castings. They are available from leading foundries everywhere. FERROCARBO® is a product by **CARBORUNDUM**

Complete technical data on Ferrocarbo is available to your foundries from Kerchner, Marshall & Company, Pittsburgh, Miller and Company, Chicago.

unlimited selection –unequaled service on...

STEEL • ALUMINUM PLASTICS MACHINERY

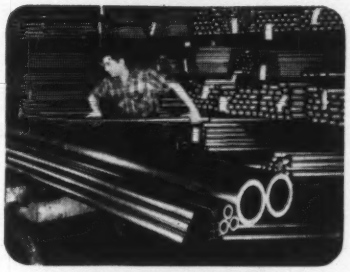


CARBON STEEL—No one even approaches the size and diversity of our stocks of hot rolled bars, plates, structurals. Published tolerances assure the industry's most exacting sawing, shearing and flame-cutting.

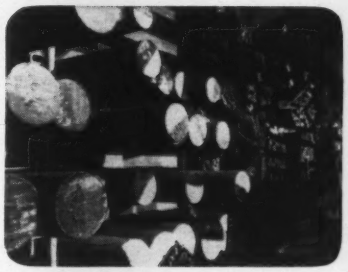
At Ryerson you will find the broadest selection of steel and aluminum in all types and sizes—plus plastics and machinery. Thus, you're assured of unbiased recommendations on material and metal-fabricating machines to speed production and reduce costs.

And backing up the size and diversity of stocks are these important services: certified quality controls; expert technical help; industry's closest cutting tolerances; dependable, on-time delivery.

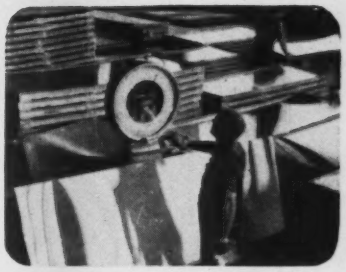
Take a quick tour of Ryerson on these pages, then contact your Ryerson representative for details.



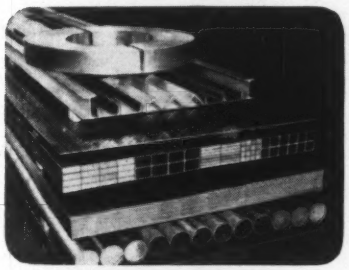
TUBING & CF BARS—Tubing: seamless and welded mechanical; structural; hydraulic cylinder & fluid line; Ledloy® 170. Bars: shafting, machinery steel, accuracy and screw stock, including fast-machining Ledloy 375 and 300.



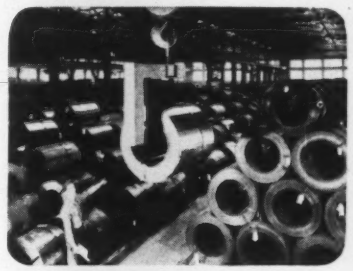
ALLOY STEEL—8-step certified quality program assures riskproof alloys—case-hardening, direct-hardening heat-treated alloys; leaded alloys, including fast-machining Rycut® steels; aircraft quality alloys; etc.



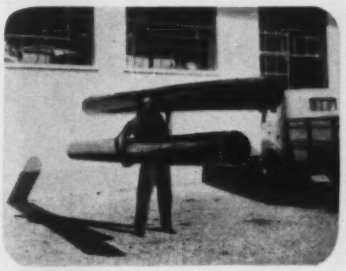
STAINLESS STEEL—2351 sizes, shapes, types and finishes in sheets, plates, bars, tubing, pipe and fittings, etc. All certified to meet ASTM, SAE, military, DuPont or GE specifications. Check in for fast stainless service.



ALUMINUM—Nation-wide service on Reynolds aluminum includes all mill products: sheets, plates, tubing and pipe; wire rod and bar; structural and extruded shapes; construction products for buildings and highways.

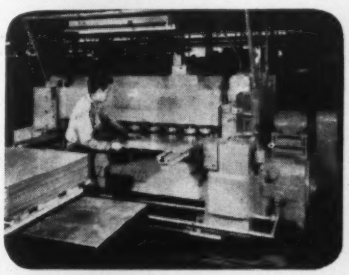


SHEET & STRIP—More than 20 kinds of stock sizes—or we can cut sheets to your order with latest shears, slitters and cut-to-length lines for faster service. Also strip coils, etc. Call us for all your sheet and strip requirements.



INDUSTRIAL PLASTICS—Ryertex-Omicron PVC pipe, tubing, sheet and rod conquer more than 281 corrosives. Also rigid Kralastic and flexible polyethylene pipe and Ryertex® laminated phenolic resin plastics.

This big friction saw bites through a 24" beam in less than 12 seconds. The accuracy of Ryerson cutting on all types of equipment is the closest in the industry.



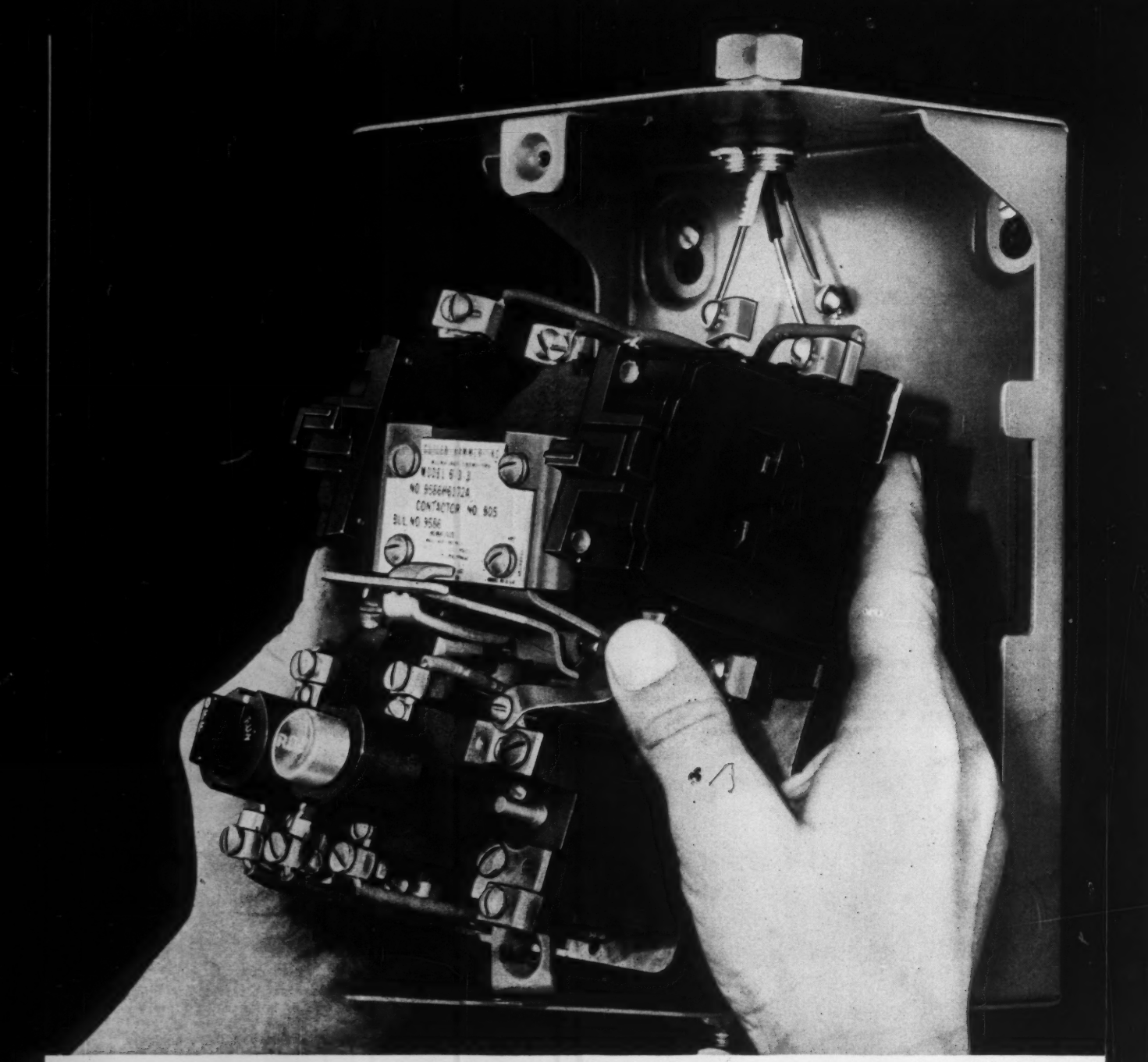
MACHINERY—More than 3800 types and models of metal-fabricating equipment for bending, braking, drilling, forming, hoisting, pressing, punching, rolling, sawing, shearing, threading and welding.

BE METALOGICAL—All the plus values of our products and service add up to giving you "optimum value for every purchasing dollar. Whatever you need—steel, aluminum, plastics, machinery—be Metalogical, call Ryerson.

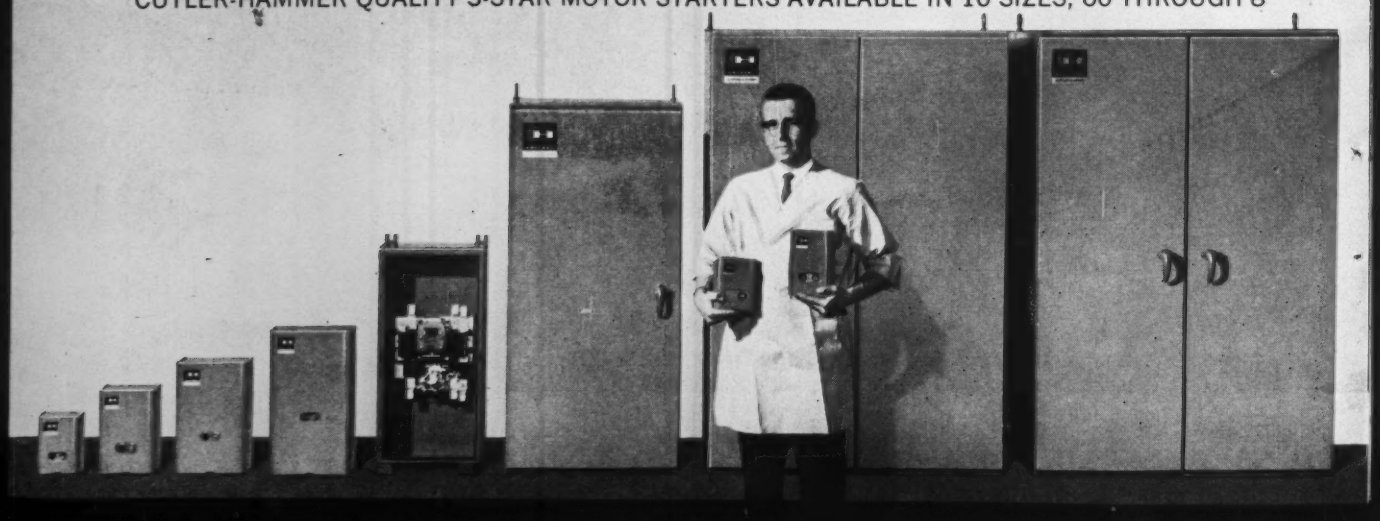
RYERSON METALOGICS

JOSEPH T. RYERSON & SON, INC., MEMBER OF THE INLAND STEEL FAMILY

STEEL · ALUMINUM · PLASTICS · METALWORKING MACHINERY



CUTLER-HAMMER QUALITY 3-STAR MOTOR STARTERS AVAILABLE IN 10 SIZES, 00 THROUGH 8



CUTLER-HAMMER MOTOR STARTERS

Still the proven standard of quality...always in stock for immediate delivery

Millions of satisfactory operations in thousands of applications have proved the unmatched quality of Cutler-Hammer across-the-line magnetic starters. That this line is still recognized as the leader—nine years after the original design was developed—is a great tribute to the years-ahead thinking of Cutler-Hammer engineers.

FIRST IN '53—STILL THE LEADER IN '61

Since the Three Star line was introduced in 1953, many improvements have been made; magnet coils that far exceed NEMA standards, for example. But many achievements of the original design—vertical, dust-free contacts; overload relays adjustable to within 3% of actual full-motor ratings; provision for 2 or 3-coil overload relays in the same enclosure—are features no other manufacturer has been able to improve. You can safely bet that when these pace-setting features are improved, it'll be another Cutler-Hammer development.

ALWAYS AVAILABLE FOR FAST DELIVERY

You'll find the smaller sizes of Cutler-Hammer Starters always in stock at your local distributors—larger sizes immediately available from the factory. We hope you'll make your own feature-by-feature comparison between the Cutler-Hammer line and any other starter on the market. Look especially carefully at such vital advantages as ease of installation, high interrupting capacity, coil construction and accessibility.

Regardless of what features you select as the criterion of superiority, we're sure you'll choose Cutler-Hammer after you've made your unbiased comparison.

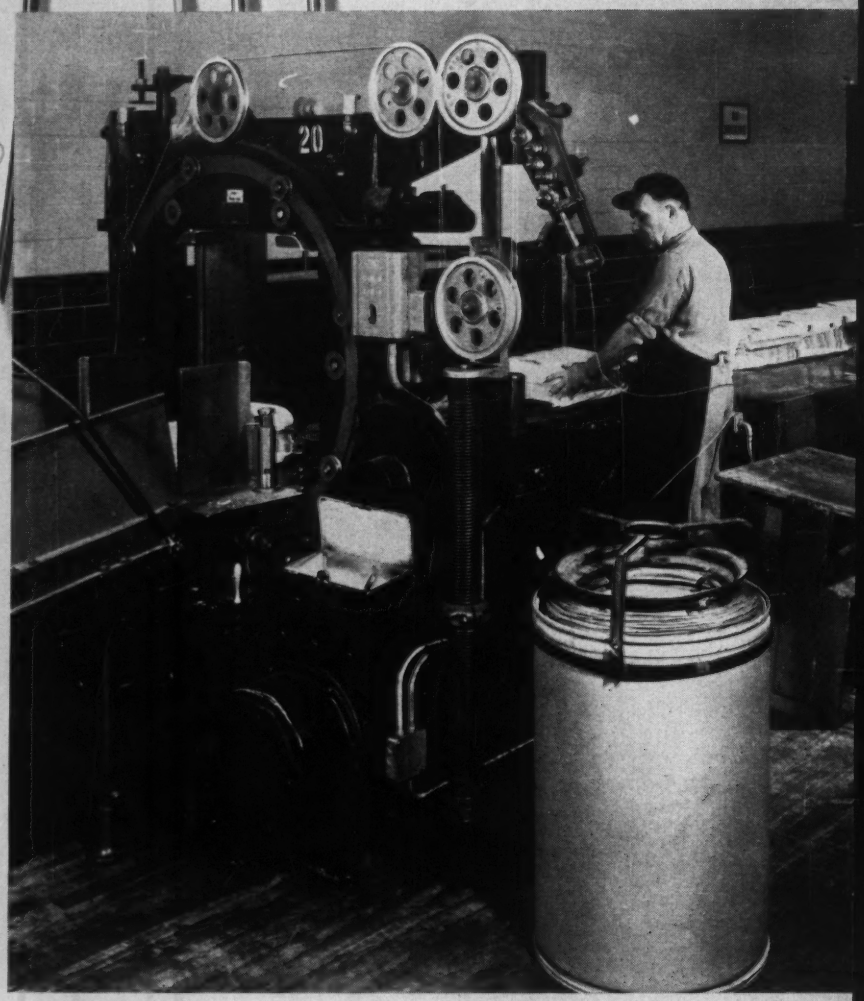
If you're one of many companies being forced to stock two sets of parts because of design changes, now is an excellent time to standardize on Cutler-Hammer.

Call your distributor or local Cutler-Hammer Sales Office soon. Or write for Publication LO-70-Q246.

WHAT'S NEW? ASK..

CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler-Hammer International, C. A. • Associates: Cutler-Hammer Canada, Ltd.; Cutler-Hammer Mexicana, S. A.



"Next to paper and ink, tying wire is our most important purchase," says Chicago *TRIBUNE* management . . . clear proof that the *TRIBUNE's* use of Republic Wire for automatic bundling of newspapers is based on preference and specification. Wire used is soft galvanized, tough, yet easy forming—perfectly suited to fast handling in this publisher's automatic wire tying machines.

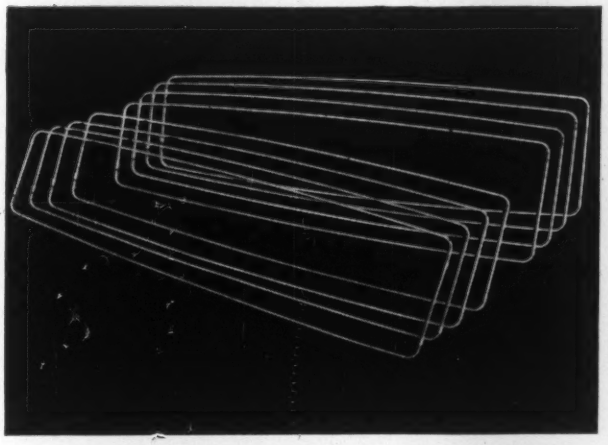
Steel

Strong
Modern
Dependable

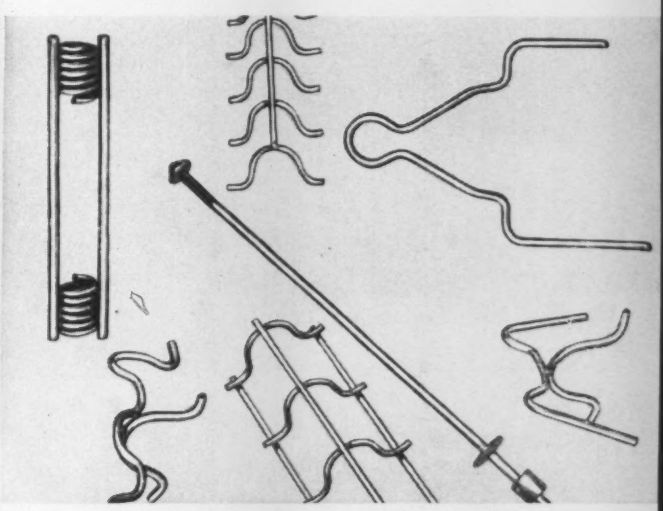
WIRE? WRITE, OR PHONE REPUBLIC

Republic has a reputation for solving wire worries. Rely on it. Talk to a Republic Wire Metallurgist—a man who knows and *understands* industry's varying needs for tensile, elongation, flow and formability. His experience, much of it gained by working on the scene with manufacturers like yourself, is backed by skill at the manufacturing level, plus undivided quality responsibility. Adherence to your specifications is under full Republic control, from ore selection to your plant . . . assuring that the wire you get will consistently meet your specific requirements.

Republic Wire Metallurgists can be called in at any time, on any problem of wire selection, application, or processing . . . *without obligation.* Wire? Write or call Republic, now.



B-W MANUFACTURERS, INC., former choice of wire for these popular trouser creasers lost its galvanized coating when flattened and bent to form the four right angles. Republic Wire Metallurgists recommended Republic *Electro-Galvanized* Wire. Result—profitable, perfect production ever since. Electro-Galvanizing electrically deposits pure zinc particles on the wire in deep uniform layers—permanently bonded and *tough*—yet pliable enough to permit tying the wire in knots without cracking the zinc coating!



MEADOW STEEL PRODUCTS, INC., keeps prices competitive on masonry construction accessories with adaptable Republic Manufacturers' Wire. More than 20 different parts are made from only a few types of wire, lowering inventory and material costs, and greatly simplifying production.

REPUBLIC STEEL

REPUBLIC HAS THE FEEL FOR MODERN STEEL

REPUBLIC STEEL CORPORATION
DEPT. IA-2545
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send information on the following kinds of Republic Wire:

- ☐ Manufacturers' Coarse Wire
- ☐ Spring Wire
- ☐ Screw Wire
- ☐ Rivet Wire
- ☐ Heading Wire
- ☐ Have a Republic Wire Metallurgist call

Name_____ Title_____

Company_____

Address_____

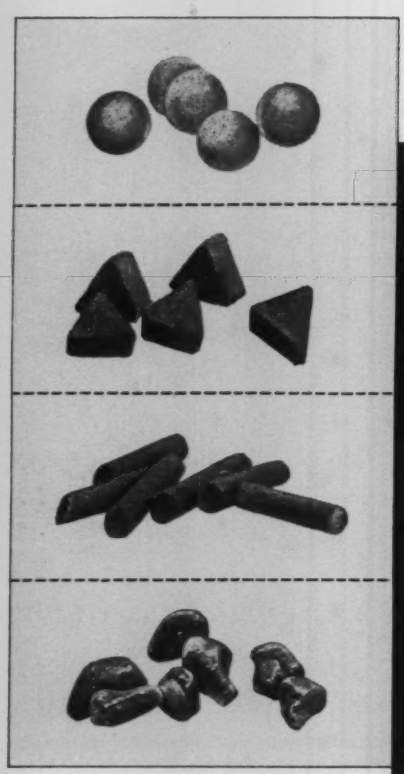
City_____ Zone_____ State_____

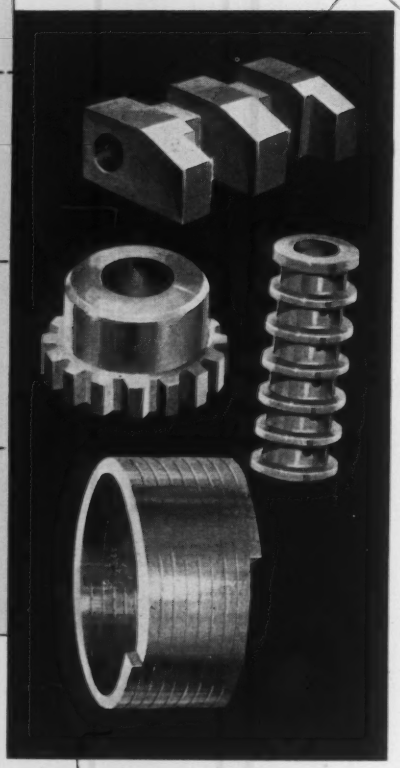
Barrel-finishing is best finishing

to cut costs of your machine parts

It's common knowledge that barrel-finishing is now the one outstanding way to cut costs and improve the appearance of mass-produced parts.

If you're missing these production advantages because you've felt your own particular machined parts may be too delicate and complicated . . . too big and heavy . . . or not the right material . . . this message is for *you!*





Barrel finishing your own machined parts with the right TUMBLEX abrasive improves their quality and appearance. And this faster finishing can cut your cost-per-piece produced.

The fact is that barrel-finishing with Norton TUMBLEX* abrasives is your surest, quickest way to remove burrs, provide uniform radii, improve surface finish and increase the fatigue strength of the parts *you* are machining.

The variety of materials, sizes and shapes covered is practically unlimited. Materials include ferrous, non-ferrous, and modern space alloy metals — also plastics and many other non-metallics. In sizes, anything from tiny roller bearings to aircraft wing spars can be handled. And shapes can be the most complicated ever processed.

For your product's eye-appeal, barrel-finishing provides excellent finish. Lower handling costs are assured by the barrel-finishing ability to combine several operations — deburring, breaking sharp edges, surface finish refinement, etc. — at the same time. In addition, your barrel-finished machined parts can be plated without burnishing or buffing — and welded or brazed after simple cleaning.

Get complete proof. Send sample parts to our Sample Processing Department. We'll barrel-finish, return samples and report the methods and abrasives you need for new production advantages. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade Mark Reg. U. S. Pat. Off. and Foreign Countries.

NORTON
ABRASIVES

G-419

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Non-Slip Floors — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

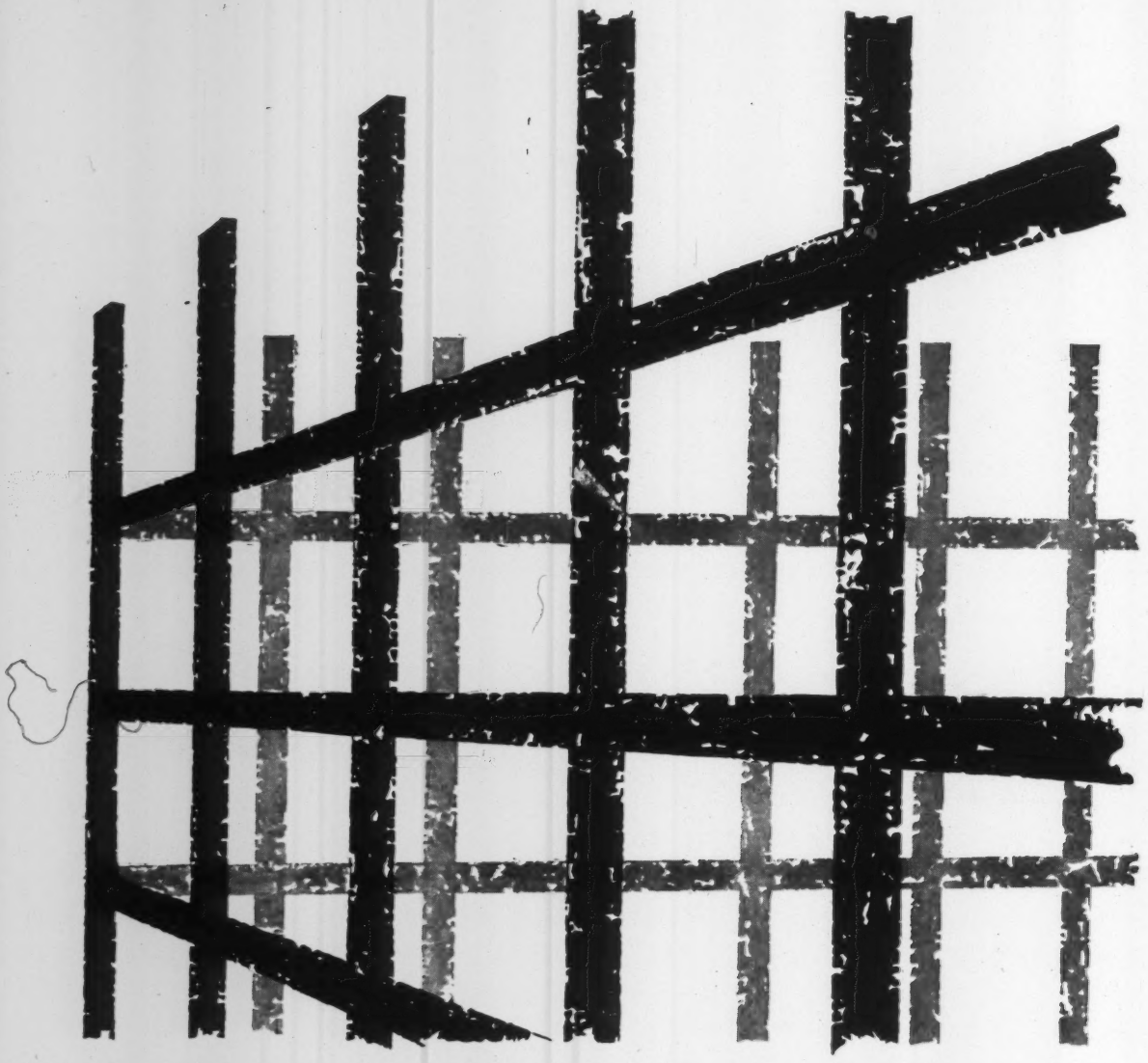
56-inch semi-continuous hot strip mill.

BLAW-KNOX HOT STRIP MILLS

Blaw-Knox designs and builds a full range of continuous, semi-continuous and single stand reversing hot strip mills. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations and auxiliary equipment for ferrous and non-ferrous metals, sheet and strip processing equipment, electrolytic tinning, annealing and galvanizing lines, seamless pipe and tube mills, draw benches, and cold draw equipment, Blaw-Knox Medart cold finishing equipment, iron, alloy iron and steel rolls, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings. Blaw-Knox Company, Foundry and Mill Machinery Division, Blaw-Knox Building, 300 Sixth Avenue, Pittsburgh 22, Pennsylvania.

BLAW-KNOX

Blaw-Knox designs and manufactures for America's growth industries: METALS: Rolling Mills • Steel Processing Lines • Rolls • Castings • Open Hearth Specialties • PROCESSING: Process Design, Engineering and Plant Construction Services • Process Equipment and Pressure Piping • CONSTRUCTION: Concrete and Bituminous Paving Machines • Concrete Batching Plants and Forms • Gratings • AEROSPACE: Fixed and Steerable Antennas • Radio Telescopes • Towers and Special Structures • POWER: Power Plant Specialties and Valves



New support for lowered construction costs

Armco Steel Corp. ♩
The Babcock & Wilcox Co., Tubular Products Div. ♩ ♪
The Carpenter Steel Co., Alloy Tube Div. ♪
Jones & Laughlin Steel Corp., Electricweld Tube Div. ♩
National Tube Div., United States Steel Corp. ♩
Ohio Seamless Tube Div., Copperweld Steel Co. ♩
Republic Steel Corp., Steel and Tubes Div. ♩ ♪
Revere Copper & Brass Inc., Rome Mfg. Co. Div. ♩ ♪
Sawhill Tubular Products, Inc. ♩ ♪
Southeastern Metals Co. ♩
The Standard Tube Co. ♩ ♪
Superior Tube Co. ♪
Trent Tube Co., Subs. Crucible Steel Co. of America ♪
Union Steel Corp. ♪
Van Huffel Tube Corp. ♩
Wall Tube & Metal Products Co. ♪

♪ PRODUCES WELDED STAINLESS STEEL TUBE
♩ PRODUCES WELDED CARBON STEEL TUBE

Structural steel men are finding excellent opportunities for savings in welded steel tubing. Both on-site and prefabricated assembly can be faster because of the excellent welding characteristics. You get the efficiency of a thin-walled, hollow section with trimness of line that integrates well with other materials—often the clean lines eliminate need for trim. Tubing can be formed to any shape—and new larger sizes and heavier wall thickness are opening new opportunities for lowered costs.

The practicality of utilizing the light-weight-to-high-strength ratio of welded steel tubing has been proved by recent experience — in modern office buildings, schools, commercial buildings—even homes. Current example: supporting curtain walls. Many of the quality tube producers listed here can supply information, or write Dept. **IA-5,** for free Booklet 8591, Welded Steel Tube Institute, Inc., Hanna Bldg., Cleveland, Ohio.

461

WELDED STEEL TUBE INSTITUTE, INC.

Problem: Exhaust hoods that don't exhaust

This plant needs make-up air! If the exhaust hoods in your plant aren't doing their full job, chances are they are being outpulled by other fans. Other exhaust fans set up a vacuum by removing air faster than you replace it. Your plant needs make-up air...a supply of new air to replace exhausted air.

Without sufficient make-up air, exhaust hoods can't do their job properly. Plant air becomes contaminated with fumes, dust, and odors. Workers' health suffers. Absenteeism rises; production lags. Other vacuum problems crop up: hot spots at inside areas, cold drafts along walls.

Solution: install a make-up air system -- fans to bring in outside air, and heaters to temper it. A make-up air system like this cancels out vacuum, gives balanced heat and ventilation.

For technical help on make-up air, see your Consulting Engineer. Or call in Sturtevant application engineers. They're experts in handling air...whether you want to move it, heat, cool or clean it. J-80711

WESTINGHOUSE ELECTRIC CORPORATION
Sturtevant Division, Dept. H-11
Hyde Park 36, Mass.

Send me your make-up air booklet.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

PHONE_____

You can be sure...if it's **Westinghouse**

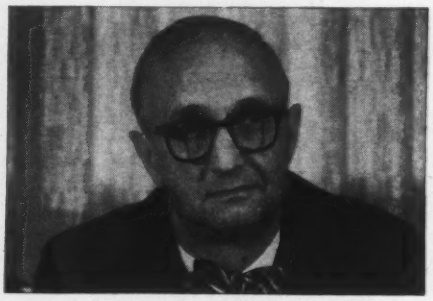
"We had 18-20 hours downtime every time we changed heats. With strip, we just hook on from heat to heat. No downtime."

"With strip we use smaller blanks to produce the same part."

"By using strip we save downtime, die repairs."

"Rejects have drooped from about 8% to less than 1%."

"We found we couldn't afford the low cost of sheet."



Read why Target Stamped Products, Inc., Kinsman, Ohio, switched from strip to sheet—and then back to strip. Comments are Harvey Haynam's, Target's president:

"We thought we'd give sheet a try back in 1958. The low cost looked too good to pass up. Today, you'd have a hard time finding a piece of cold rolled sheet around the shop.

"We were absorbing 18-20 hours of downtime every time we changed heats. With strip, we just hook on from heat to heat. The characteristics are the same from heat to heat and coil to coil. We don't waste time adjusting our dies.

"Strip saves us metal. We can use smaller blanks to produce the same part. I'd say we save from 1/16" to 3/32" of metal per part. That's a lot of steel when you're turning out 25-30 million parts a year.

"We don't have gauge problems now. The strip we buy is always rolled within our working tolerance. We work to a plus or minus .0025 inches.

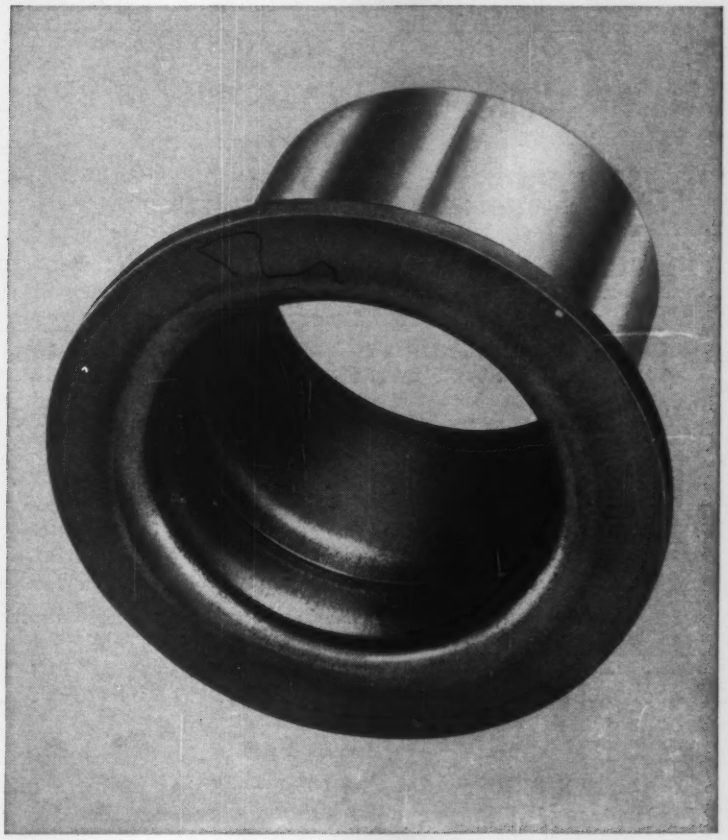
"So far, strip hasn't given us lamination troubles. It doesn't take much lamination to give you big trouble in a deep drawing operation. When the metal separates, part may stick to the punch while part stays in the cavity. As another blank transfers to the same station, there's a double smash and the die is ruined. That hasn't happened with strip. Saves a lot of downtime and die repair.

"Strip takes a deep draw without thinning out on you. Its uniform temper pays off when you're turning out Silent Blocks where both the ID and OD have to be right or the part's a reject.

"All in all our rejects have dropped from about 8% to less than 1% since we switched back to strip.

This mark tells you a product is made of modern dependable Steel.

Outer metal bushing of a Silent Block. Target Stamped Products turns out millions of these each year for the auto industry. Silent Blocks are used in the suspension systems of all American cars—about eight to a car. To produce the piece, Target must work to a plus or minus .0025" tolerance or the Silent Block won't work. When Target switched back to strip, their rejects dropped from about 8% to less than 1%.



"You can have all the automation in the world, but if you're using the wrong steel, it just nickels and dimes you to death. With strip our machines keep working; we need less supervision, less tool repair. Our trim is small and our percentage of rejects is the smallest we've ever known. We found out we couldn't afford the low cost of sheet. That's why we're back with strip."

The switch is back to strip

Cold rolled sheet steel can be your best buy on a cost per pound basis. Certainly its quality has risen sharply since the war. But, pound cost is only part of the story. If you really need steel tailored to your specific production requirements, cold rolled strip is the answer.

Strip is not sold on an as-rolled basis. What you buy is a specific chemistry, temper, dimension, edge and finish to precisely meet your fabricating and end-use requirements.

American Steel and Wire has over 12,000 mill practices in available strip specifications. Many of your processing steps may actually be eliminated by using cold rolled strip.

Take a hard look at your production line and let our salesmen look with you. Check your rejects, your downtime, your scrap rate. Perhaps you can improve the quality of your product and cut production costs at the same time, with *tailored-to-the-job* cold rolled strip from American Steel and Wire. American Steel and Wire Division, Rockefeller Building, Cleveland 13, Ohio. USS and American are registered trademarks

USS American Steel and Wire Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal and Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, New York, Distributors Abroad

METALGRAMS

. . . news of "Electromet" ferroalloys and metals

UNION CARBIDE METALS

SEPTEMBER 1961

CHARACTERIZATION OF FERROALLOYS -- To provide more complete information to steelmakers, UCM recently published data on the occurrence of hydrogen and non-metallic inclusions in alloy additives. Laboratory and field studies made over a period of many years demonstrate that these raw materials, which are used to control the composition of steel, exert a negligible influence, if any, on the gas content and inclusions present in steel. For details, write for the article, "Alloy Quality Versus Steel Quality," in the Summer 1961 issue of UNION CARBIDE METALS REVIEW.

* * *

TUNGSTEN -- HELPS ALLOYS RESIST HEAT -- Because of tungsten, high-speed steel and non-ferrous tools have cutting edges that stay hard under extreme friction and high temperatures. Hot-work tool steels punch, shear, or form metals at high temperatures without softening. Iron- and cobalt-base turbine blades, afterburners, and tailpipes resist erosion and heat from fast-moving hot gases. Union Carbide Metals supplies ferrotungsten, self-reducing tungsten, scheelite, and tungsten metal powder for such additions. Your UCM representative can give you further information. Also, ask for the article, "The Elements That Surround Us: Tungsten," in the Winter 1960 issue of UNION CARBIDE METALS REVIEW.

* * *

MANGANESE IN ALUMINUM -- In binary alloys, manganese improves the strength of aluminum by 20 per cent with no sacrifice in corrosion resistance. Thus, 3000 series alloys (containing 1.25 per cent manganese) are good general-purpose alloys for storage tanks, piping, furniture, TV antennas, awnings and siding, and chemical equipment. Manganese is also added to 2000, 5000, and 6000 series alloys to improve corrosion resistance. UCM offers low-iron ferromanganese and "Elmang" electrolytic manganese for such additions. More information can be obtained by writing for the article, "Manganese Puts Muscle in Aluminum," in the Winter 1961 issue of UNION CARBIDE METALS REVIEW.

* * *

SALUTE TO STEEL FOUNDRIES -- In 1861, the first steel castings made in the United States were poured in Buffalo, N. Y. They were railroad castings, still an important use of steel castings today. This year, steel foundries observe their first 100 years of serving the railroad, earth-moving and construction equipment, rolling mill, mining equipment, military, oil and gas, automotive, and other industries. Some 275 foundries in the U. S. and Canada can pour about 2 1/2 million tons per year for these uses. Union Carbide Metals wishes the steel foundry industry continued growth and success and looks forward to serving its ferroalloy needs in the future. Your UCM representative is always at your service.

* * *

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. In Canada: Union Carbide Canada Ltd., Toronto.

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INCREASES IN INVENTORIES will be made by manufacturers during the third quarter, according to a recent Commerce Dept. survey. Stocks are expected to rise by $1 billion, seasonally adjusted, over second quarter levels. And durable goods makers are expected to account for two-thirds of this rise.

INDUSTRIES WITH BEST GROWTH PROSPECTS over the next five years have been indicated by almost 700 security analysts. They pick electrical equipment, electronics, and office equipment. The poll of the analysts was run by Opinion Research Corp.

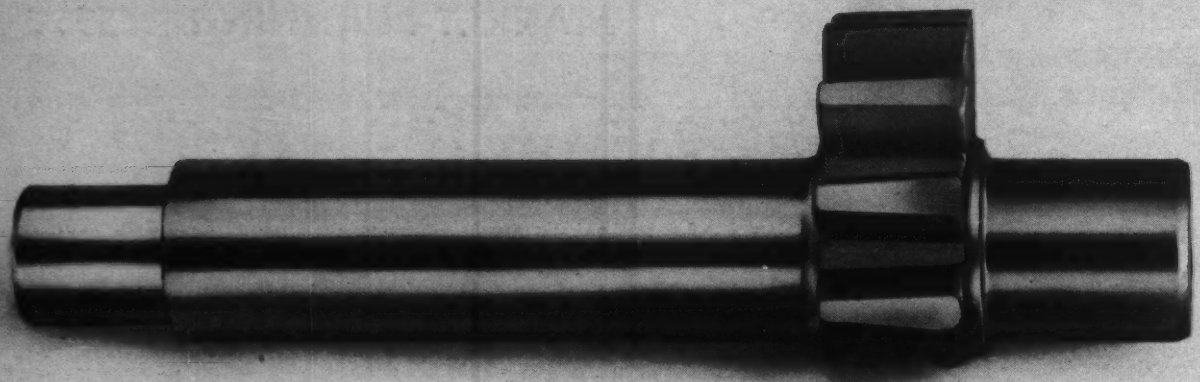
PLANS TO GO TO OXYGEN steelmaking and to finance facilities to reduce raw costs have been confirmed by Pittsburgh Steel Co. In a proxy statement submitted in connection with a proposed stock issue, these plans are revealed: Construction of two new oxygen converters; construction of a sintering plant; improvement of hot rolling facilities, and participation in the ore development at Wabush Lake. Financing totals $35 million.

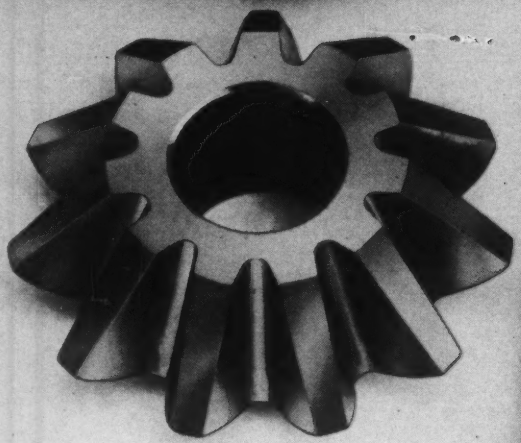
A BASIC MARKETING RESEARCH STUDY to expand uses of gray iron castings is being sponsored by a group of leading U. S. merchant pig iron producers. The four-year study will be managed by the Gray Iron Founders' Society. The study will try to find what product designers and others like and dislike about iron castings. A program to implement findings is included.

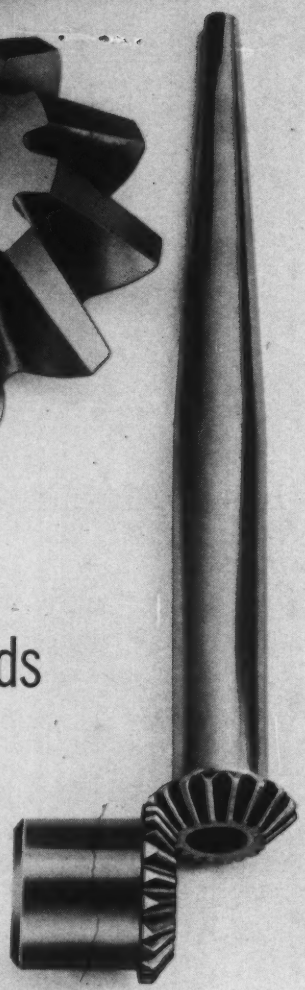
INDUSTRIAL HEATING EQUIPMENT scored a big jump in new orders in July over year-ago level. Orders were up 36 pct from the 1960 level of $3,966,000. This new strength in order volume has boosted business for the first seven months to $47.6 million, off four pct from 1960.

CONTRACTS FOR FUTURE CONSTRUCTION amounted to $3.5 billion in July. This is down two pct from a year ago, and off one pct from June. Continued strength in apartment building boosted residential contracts to $1.5 billion, 13 pct over June. Non-residential building remained level at $1.1 billion. And heavy engineering dropped 22 pct to $873 million.

APPLIANCE RETAIL SALES dropped in the U. S. during the first two weeks of August. Only seasonal showings in air conditioners and refrigerators carried any strength.







THE Gleason Revacycle® method and its machine present the fastest way known for cutting precise straight bevel gears.

The Revacycle cutter holds roughing, semifinishing, and finishing blades. One revolution of the cutter completes a tooth space in 2.6 seconds. In fact, on smaller pieces, you can cut even faster . . . and complete as many as four tooth spaces in a single cycle at less than ½ second per tooth!

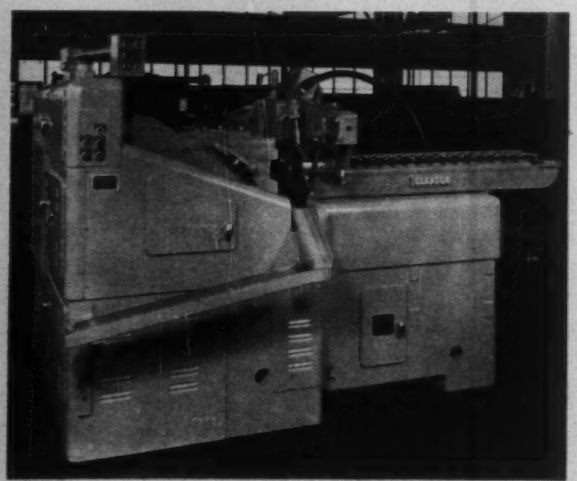
This completely automatic Gleason machine can frequently replace a tandem of roughing and finishing machines . . . thereby saving considerably on capital investment.

Best of all, to get this speed and economy you need sacrifice nothing in accuracy. The Revacycle method produces localized tooth bearing which permits any practical assembly tolerances while avoiding load concentration at the ends of the teeth. And, you get exact reproduction piece after piece, day after day.

The machine accepts a wide range of work: diameters up to 10″ at a 5 to 1 ratio and face widths up to 1.25″.

For complete background and data, write for a bulletin. Gleason engineers will help you with details on any specific applications.

How to cut a bevel gear tooth in 2.6 seconds



1.2 seconds is all it takes to complete the load and unload cycle on the 109 REVACYCLE Machine, arranged for cutting steering segments.

GLEASON WORKS

1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.

90A

Senators Launch Attack Against "Phantom" Steel Price Hikes

A powerhouse of Democratic senators launch an all-out drive to halt steel price increases—before they are reality.

It represents the full force of the party and the Administration against increases.

By R. W. Crosby

■ The most powerful group in the U. S. Senate has thrown its collective weight against a price increase by the steel industry.

And this group of "liberal" Democrats, studded with such influential names as Humphrey, Kefauver, Gore, Douglas, and Symington, means business. A concerted effort by these men, representing a majority in the Senate, could make or break just about any legislation.

Now, they have begun a concerted effort against a steel price increase.

Plan of Attack — The attack against any plan to raise prices could be called a blitzkrieg. About a dozen senators attacked the steel industry from every angle possible. If they could work in their pet areas, they did so.

The senators all say a price increase in steel would injure the economy, the consumer, the farmer, small business, other industries, foreign trade, employment, and even the housewife. They argue that it would not only be economically immoral, but it would be illegal.

The Timing—The timing of this well-planned attack, replete with charts and graphs on the floor of the Senate, has a definite purpose. It adds up like this:

Rumors are rife that steel companies plan to increase prices this fall;

Congress will be adjourned soon for the fall recess;

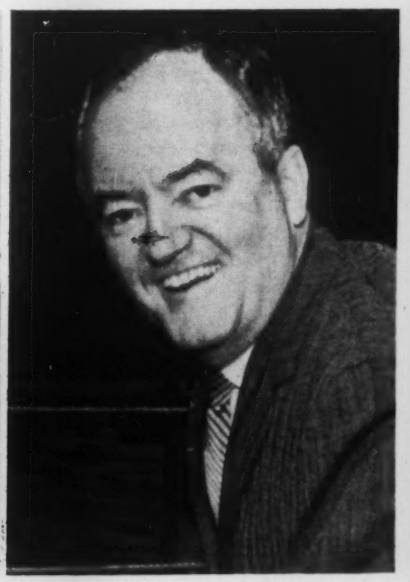
Therefore, scare the steel companies out of increasing prices during the time Congress is unable to act.

Although this type of moral suasion is not direct control, it can have the same effect. The importance of the group attack can not be over-emphasized. This group represents the Senate majority, the Administration, and the forces of trust-busting, small business, the consumer, and labor. Like a single voice, they agreed the nation's steel companies could not justify price increases this fall.

Rebuttal Coming—In the midst

KEFAUVER: Would increases violate 1951 consent decree?

SPARKMAN: An adverse effect on small business . . .



HUMPHREY: An open season for inflation . . . Set a good example . . .

DOUGLAS: A contradiction for an industry with excess capacity . . . to raise prices when it should keep them down to attract business.

GORE: A steel price boost coupled with deficit spending could cause inflation . . . President Kennedy should use moral suasion.

of the Democrats' attack, Republican Senate Leader Everett Dirksen and Senator Jacob Javits promised a rebuttal. This minority rebuttal was expected this week, but it will have only the effect that the word "minority" connotes.

During the week, steel industry leaders would not comment on the Senate drive against a "phantom" steel price increase. Up to now, there has never been a firm plan to raise steel prices. Time and time again, industry men have discussed the price situation.

Relief Needed — It's agreed a price increase is needed, but there has never been an analysis of products, amount of an increase, or when, other than acknowledging an Oct. 1 increase in labor costs.

Most spokesmen concede competition will be a factor, both here and abroad. Up to now, competition has been too rugged for a steel price increase to stick. Price weakness will have to go before any serious thought would be given to higher prices.

Not Afraid — But steel executives will not admit that fear of punishment by the government, either by public censure or legislation, will be a factor in preventing a price increase if justified by market conditions and financial considerations.

What really concerns steel men are these points:

1. There has been no price increase since August, 1958 and the industry has received no credit from Washington, or any other place, for absorbing fringe and wage increases for three years.

2. Some steel people believe the Administration has set up a straw man and is now trying to knock it down.

3. There is personal frustration that the government never attacks price increases in other industries, but always singles out steel.

4. Many are convinced that the Administration will promote "scare" talk instead of threatening or invoking unpopular outright controls.

Big Guns—The Senate attack was led by Sen. Albert Gore of Tennessee. He pointed out that a study of steel prices by President Kennedy's Council of Economic Advisors shows that steel producers neither need nor deserve higher prices. He then made these points:

1. A steel price boost coupled with deficit spending and scare buying could cause inflation.

2. President Kennedy should take action now to stop the price hike by "moral suasion."

3. The Federal Trade Commission should police the steel industry more closely.

4. If all else fails, the large steel companies should be broken up "so that true competition, including price competition, may be restored."

He was followed in quick succession by Senators Paul Douglas of Illinois, Joseph Clark of Pennsylvania, Eugene McCarthy of Minnesota, Frank Moss of Utah, Stuart Symington of Missouri, Gale McGee of Wyoming, A. S. Mike Monroney of Oklahoma, Russell Long of Louisiana, Maurine Neuberger of Oregon, John Sparkman of Alabama, Hubert Humphrey of Minnesota, and Estes Kefauver of Tennessee, the long-time foe of the steel industry's price policies.

Humphrey Strikes—Senators Kefauver and Humphrey, because of their status as Democratic leaders, have important positions in the attack.

Sen. Humphrey said a rise in steel prices this fall would signal "open season on inflation." He said a price rise almost certainly would lead to higher wage demands again next year which would snowball and "in turn, set an example for wage negotiations everywhere and so weaken the dollar."

"If the price line is held by the steel industry," he said, "a very powerful example of good behavior will have been given to other managements and to unions throughout the economy."

Kefauver's Blast — Senator Kefauver took the antitrust tack, conjuring up visions of price fixing. He warned that any steel price boosts would raise a serious question of whether that would be a violation of a 1951 consent order.

That order, entered into by the steel industry and the Federal Trade Commission, forbade any industry agreements to "adopt, establish,

fix, or maintain prices."

The popularizer of the term "administered prices" contends that an industry-wide price rise might well be proof of collusion and price fixing, thus a violation of the consent order.

Administration's Record — This concerted attack on steel price increases is no surprise. It had its beginning as far back as pre-election time. In the Democratic platform of 1960, the new Democratic hierarchy promised to "restrain" the so-called "administered price" industries, mainly steel.

Ever since then, Sen. Kefauver has waited with his gun loaded waiting for a real threat of a price increase in steel.

The Kennedy Administration very early let it be known it opposed steel price increases. John Kenneth Galbraith, a top administration adviser, called for a major effort to halt "the upward thrust of prices," particularly steel prices, as far back as last December.

In June, word first leaked out of the President's economic advisers' study to determine if steel price increases were justified. (IA —June 8, '61, p. 63)

This is the study Senator Gore said shows the steel industry does not need or deserve a price increase. At the same time as the Council of Economic Advisers reached this conclusion, studies by the Dept. of Defense and the President's Labor-Management Commission all related to price increases, were being made. And President Kennedy began talking to price experts on how price controls work. (IA—Aug. 3, '61, p. 45)

Then last week came the Senate attack.

Senator Douglas said it was a contradiction for an industry with excess capacity to raise prices at a time when it should actually keep prices down to attract more business.

Senator Sparkman, a self-appointed defender of small business, said an unjustified price increase by the steel companies would have an adverse effect on small business.

AMC Upsets Auto Labor Pattern

Profit sharing, as introduced in American Motors contract, violates previous labor patterns.

It's Romney's second big impact on the auto industry.
By R. D. Raddant

■ American Motors' George Romney has made his second big imprint on the auto industry.

The first was the small, or compact car which orthodox automakers didn't take seriously. Seriously, that is, until the combination of AMC's Rambler and a flood of imports forced the Big Three compacts.

Now, Profit Sharing—The second is the principle of profit sharing. This was introduced into collective bargaining in the auto industry by last week's settlement of AMC with the United Auto Workers.

"Profit sharing," as such, may never be accepted throughout the auto industry. But the AMC-UAW settlement for the first time brought the company's financial position to the bargaining table.

This has been a goal of UAW president Walter Reuther since he first took on General Motors in 1945-46. Then his "let's look at the books" tactics got nowhere. Now, it will be hard to dislodge.

But even without the profit sharing, the AMC settlement yielded more than the offer last week by General Motors, Ford, and Chrysler.

The Settlement—In review, here are the major points of the agreement:

A "progress sharing" plan in which AMC workers will share 10 pct of the gross profit after 10 pct of the stockholders' equity has been deducted.

An additional 5 pct made available to employees in AMC stock.

A 6¢ per hour or 2.5 pct annual wage increase.

Continuation of the present cost-of-living clause with 12¢ of the 17¢ float included into basic wages.

Improved supplementary unemployment benefits to 62 pct of gross pay plus an allowance for dependents.

Provision for 65 pct of pay for short work weeks.

A moving allowance for workers transferred to another city.

Improved hospitalization insurance, increased life insurance, and improved pensions, fringes.

The company retained a clear statement of right to manage.

Not Easy—The package, which many consider a fat one, actually did not come easy for Mr. Romney and E. L. Cushman, AMC vice president and chief negotiator. As late as the middle of last week, The IRON AGE was told that elimination of the cost-of-living clause was considered a must.

Apparently Mr. Romney wanted the settlement before the Big Three, although his company's contract did not expire until Sept. 6. His "progress sharing" plan took the Big Three by surprise earlier.

Heresy — This was considered heresy according to accepted automotive collective bargaining. But there was no assurance or indication that it would be picked up in further negotiations.

For one thing, Chrysler's poor position virtually eliminates profit sharing as a factor.

But, the UAW could not be expected to settle for anything less than the AMC package. Without profit sharing, something else would have to be added.

Foundries Sell Tensile Strength

Guaranteed Performance Is New Selling Tool

Founders are drawn into product design problems when they guarantee tensile strength.

Buyers accept new approach. Original costs are higher but savings are made in product performance.

By T. M. Rohan

■ Gray iron foundrymen are trying a new selling concept these days. The traditional selling of castings is by weight or by unit price and meeting certain minimum specs in a separately cast test bar.

Now a new element is creeping in. Several are trying to put across the concept of selling a guaranteed tensile strength in the casting, where strength is the big need. By being assured of a given tensile, the buyer can re-design to shave the overall weight by possibly 20 pct or more without loss of strength. Conversely, for the same weight, he can get more strength. It's a low-cost method of getting more strength from economical gray iron using the same or slightly modified patterns rather than going to higher-cost materials.

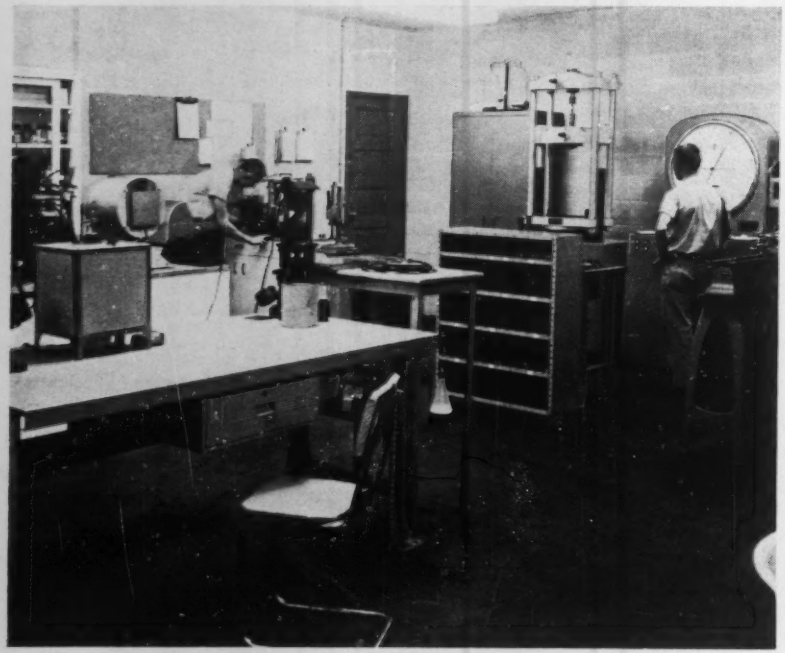
Many Do It—Although many iron foundries have been doing the equivalent, informally, for years, probably the first to formalize the concept is Dalton Foundries, Warsaw, Ind. A few other large ones which have been doing it on occasion are Superior Foundry, Inc., and Forest City Foundries of Cleveland; Hamilton Foundry, Inc., Hamilton O., Frank Foundries Corp., Moline, Ill., Lynchburg Foundry Co., Lynchburg, Va., and Grede Foundries, Inc., Milwaukee.

Most common applications are flywheels where the weight saving is important and designs are simple. Other are compressor crankshafts and cylinders, pump housings, transmission cases and power steering housings for truck and busses, locomotive engine parts, and hydraulic components. In all these, a decrease in weight results in higher payload or better portability.

"On one flywheel we have been able to save 23 out of a total of 108 lbs. on the web and still keep all the rim inertia," says J. J. Shellabarger, Dalton vice president of sales. "This flywheel started as steel. Cost has been progressively cut down through going to pearlitic malleable, and now gray iron with guaranteed tensile strength in the casting. We have made similar weight saving possible on pump bodies and some crankshafts.

Design Control—"Checking each ladle will assure minimum tensile strengths in the casting up to 45,000 lbs. Surprisingly, most designers specify various class irons rather loosely. They have never been told that if the test bar meets tensile specifications, the requirements are fulfilled regardless of how the actual casting tests. This is traditional because the foundry has no control over design. In the new approach, the foundry must be advised of design considerations.

"Normally, because of the wide bracketing of A.S.T.M. specifications in 5,000 psi increments, the designer over-designs to compensate for variations at the foundry. This new guarantee of strength in the casting allows the designer to shave off some weight without losing strength. Many old designs have a 10-fold safety factor. Now, the price per lb. will go up slightly but the price per unit will stay the same or decrease. And, more importantly, weight saved will pay for itself in



TEST OF STRENGTH: Selling tensile strength requires continual close laboratory testing and analysis. Testing here is being done at the laboratory of the Dalton Foundries, Inc., Warsaw, Ind.

more payload and also increase saleability of the units."

Other industry leaders have approached the plan more cautiously. But they feel it could be a major step in upgrading castings through better design. And it could do much to uplift the industry.

New Spec—"A project like this is long overdue. It is mainly a question of careful control of processes, having personnel with proper training and taking advantage of their ability," says Charles Walton, technical director of Gray Iron Founders Society, Inc., Cleveland. "Part of it stems from a new A-48 revised specification," he adds.

"Gray iron is more sensitive to changes in thickness than steel so it's more difficult to control. This approach is especially suited to longer runs of casting where weight saving is worthwhile."

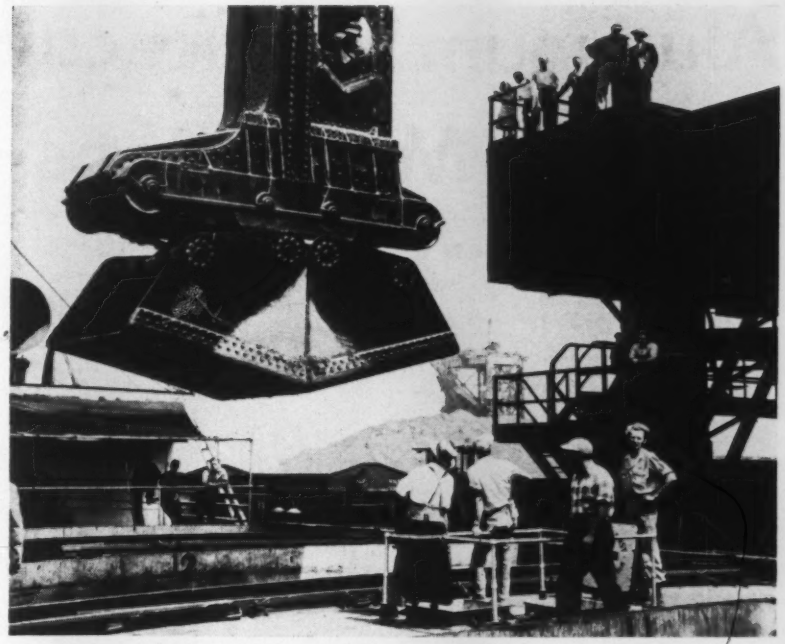
The extra care and control necessary to produce this should, of course, be worth at least a modest premium to the foundry. But foundry competition being as sharp as it is, some producers have found their advantage hard to retain. The necessary engineering gets a little costly too.

"We made a few runs where there was a critical tensile strength and were able to get a modest premium to cover the extra work," says William Seelbach, vice president of Forest City Foundries, Cleveland. "But on the second lot, somebody else got the order who couldn't possibly have figured in the extra work involved.

Supplier Check—"Most of the better customers prefer to come in to the shop and look it over. Then you are either 'qualified' or not, and the order goes to the lowest price among the qualified suppliers."

Another Cleveland foundry discovered castings buyers worked out a guarantee system of their own.

"We have found that buyers, after buying the first lot of a casting with certified tensile strengths, put the specification right on the blue print," says Lloyd Leeseberg of Superior Foundry, Inc., Cleveland.



LATE SEASON RUSH: Great Lakes ore docks are busy as steelmakers sense growing demand and add more ore carriers for an unprecedented push.

Ore Fleet Grows With Steel Pickup

■ Great Lakes iron ore shipping, which has wallowed along all summer, is showing signs of a moderately strong finish. Extra boats have been added to the fleet as steelmen lay down the raw materials for a winter rush on steel plus strike hedge buying in the spring.

Even though ore piles are still at mountainous heights, all available room is being filled. In large measure, this reflects the 1959 strike when about 60 pct of the ore shipping season was wiped out and boats were pushing ice and setting new records for late shipments.

Costs Money—This spring, 131 of the total of 210 boats were sailing by June 15. By July 15, eight more had been added.

Although late season start-ups can cost possibly $100,000 or more, Cleveland Cliffs had enough demand to commission another one. Bethlehem added two more, principally to serve the Lackawanna mill. And Kinsman Transit and Shenango Furnace Co. brought out an additional one each.

Reason to Worry—Steelmen are, of course, concerned about next year. If it follows the pre-strike pattern of 1959, steelmaking will go to capacity and iron ore consumption with it as customers load up. If a steel strike materializes, most of the ore boats go out with it at the height of their season. If it is a long strike, this would cause a pinch through the 1962-63 winter.

Despite the rally, shipments are trailing far behind last year and will get nowhere near the 69 million tons then. Through Aug. 1 this year they totalled 24 million tons or 18 million behind the same time last year.

Aluminum Is on Recovery Ladder But Still Many Steps From Top

Aluminum sales have made a good recovery from the low-point earlier this year.

But not all producers agree on the extent. And price competition is still a problem.

By G. J. McManus

■ Aluminum business is better but it is still not good enough.

This is the composite reaction of major producers to questions about market prospects and problems.

Averaging out comments, you get a picture of broad and gradual improvement. Demand for aluminum moved up during most of the first half. During the traditionally slow summer months, orders have held at levels well above the recession low.

No Big Recovery—The upswing has reached the point where the first signs of price firmness are starting to appear. However, there has been no decisive surge in recent weeks and demand is still a long way from balancing supply and producing real price stability.

And in the minds of most aluminum men, there can be no real recovery without price relief. Producers feel aluminum prices are too low generally. They say schedules have been bent badly out of shape by commodity listings.

Not too Bad—This condition has tempered the enthusiasm of suppliers for a recovery that is certainly impressive on paper. Shipments of aluminum mill products topped 300 million lb in June. This was 26 pct over the February total. It was the best for any month in two years.

Official statistics are not available for more recent months but producers say there has been no sharp summer letdown. Business is currently running at least even with the June rate, says W. T. Ingram, general sales manager, Reynolds Metals Co.

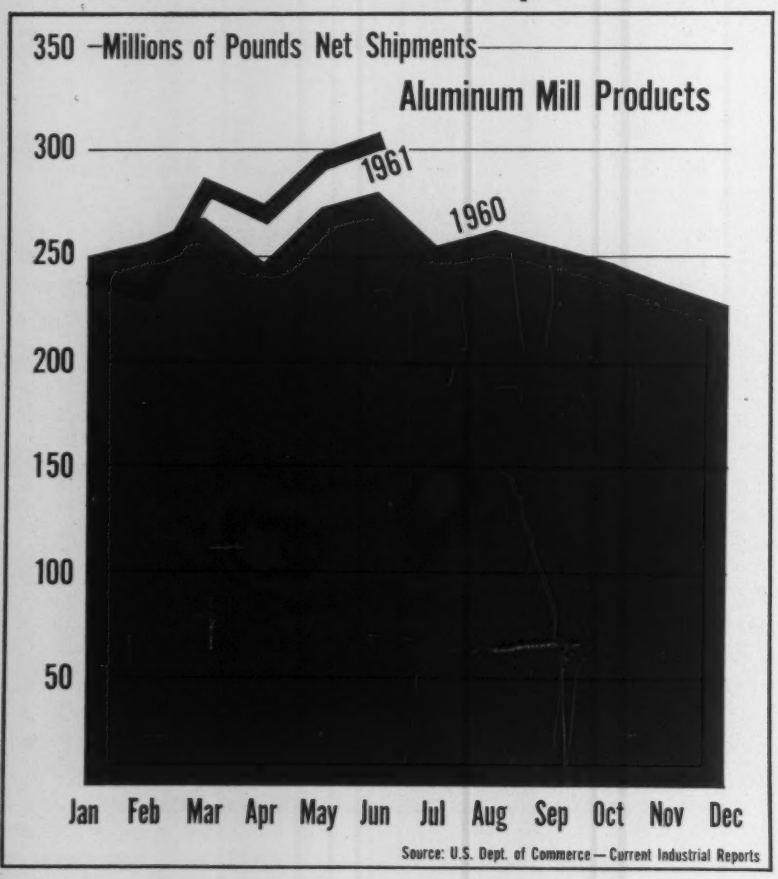
Broad Based—"The increase has just been an accumulation of better business generally," says Mr. Ingram. He explains that no one market or product has suddenly spurted; across the board, customers are coming in with a little larger orders.

"Our aluminum product sales turned upward significantly about the beginning of the second quarter," says F. H. Edgar, vice president, aluminum sales, Olin's Metals Div., Olin Mathieson Chemical Corp. Mr. Edgar says there has been a seasonal easing over the last two months but that extrusions have resisted this general trend.

The most bullish report comes from Kaiser Aluminum & Chemical Corp. Kaiser has restarted eight potlines since April. The company has raised operations from 50 pct at the recession low to 90 pct currently.

Upturn for Kaiser—"We've had an increase in our domestic business of just about 50 pct since

Up, But Room for Improvement



Source: U.S. Dept. of Commerce—Current Industrial Reports

January and February," says T. J. Ready, Jr., executive vice president and general manager of Kaiser.

"We think there has been an increase of about 3 pct over the first half of 1960," says Mr. Ready. "For the full year, we think there will be a gain of about 10 pct." Included in this forecast are boosts of 18 pct for aluminum electrical conductors; 8 pct for extrusions; and 11 to 12 pct for sheet.

No allowance is made for a possible spurt in defense business. This could be a significant point. "We've had quite a sharp rise in inquiries from companies associated with defense work," says Mr. Ready.

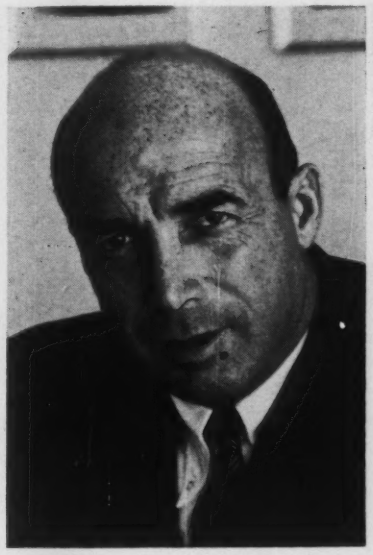
Nothing for Alcoa — The only completely sour reaction comes from Aluminum Co. of America. Alcoa says there is nothing to talk about, that August has been a dull month, prices are still unstable, and there is no big change in orders or inquiries. However, Alcoa's operating rate is now 78 pct, which many industries would consider a healthy level.

The whole question of aluminum operating percentages puzzles many. Producers explain price weakness has been due to the pressure of idle capacity. Yet the aluminum industry averaged better than 80 pct of capacity in 1960. Primary production was the highest in history.

Reflects Business—On a month by month basis, one producer estimates production dropped to a low somewhere between 65 and 75 pct; same source says the recovery has seen a climb to about 80 pct of capacity. These do not seem like distress levels, when compared with the steel industry average of 67 pct last year and its drop to 48 pct this year.

In part, the explanation may be that inventory adjustments of producers have concealed the extent of the aluminum swing. Kaiser feels its own production drop to 50 pct reflected the actual business decline and that its rise to 90 pct is a true measure of the recovery.

KAISER'S READY: "We've had an increase . . . of just about 50 pct since January and February."



REYNOLDS' INGRAM: "We're starting to screen orders . . . this will happen more and more."

New Capacity—Also, aluminum capacity figures represent new facilities to a large extent. The steel industry is quick to point out that marginal equipment makes up a substantial part of its idle capacity. The idle lines of aluminum producers are new and unpaid for in many cases.

"The industry has grown so sharply the bulk of its capacity is relatively new," agrees Mr. Ready of Kaiser.

Finally, the youthful and fast-moving aluminum industry has not had time to learn all the answers by trial and error.

"We've seen a lot of new things happen in the past year," says one official. "Whether we've learned anything, I don't know."

Sure Case—However, aluminum men feel there is nothing wrong with their business that increased volume won't cure. The basic approach of selling by markets rather than products is considered sound. Some reforms are needed, say producers, but it is competitive pressure that has broken down price structure, not market selling.

Whatever the cause, aluminum men admit their prices have gotten out of balance. In the building field, there have been different prices on building sheet, siding, shingle stock, awning sheet and others.

The result, says one official, has been a general "slop-over" of commodity prices. Customers have been buying the lowest priced commodity, regardless of the application.

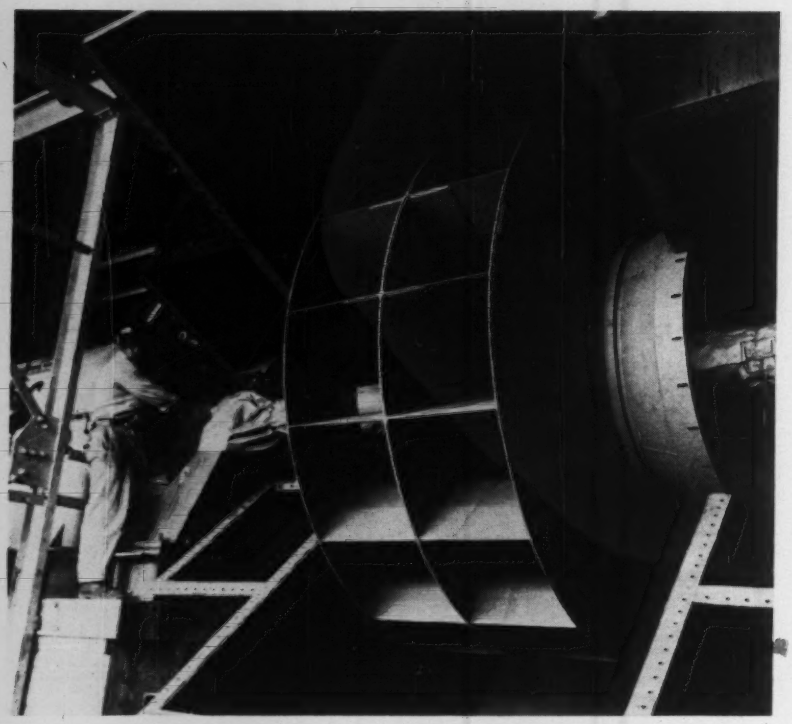
Price Corrections — This problem is starting to correct itself as business improves. The price gap between building sheet and specification sheet narrowed recently.

Along the same lines, Olin Mathieson Chemical Corp. recently announced it is increasing its price for aluminum siding by 8¢ on Sept. 30. There has been no rush to follow Olin's move.

Still Unsettled—However, aluminum men feel these changes do indicate a pull-back by the industry from its all-out price competition.

"We're starting to screen orders," says Mr. Ingram of Reynolds. "As people get filled up, this will happen more and more."

Mr. Ingram says full price stability could be 12 to 18 months in coming.



GAS GRABBERS: Giant fans, up to nine feet across, will force waste gas from Bethlehem's openhearths into precipitators. More than 95 pct of the dust from oxygen steelmaking will be removed by precipitators.

Smoke Control Units

■ Bethlehem Steel Co. is moving to clear the air around its openhearth installations. Sixteen furnaces, seven at Sparrows Point, Md. and nine at Lackawanna, N.Y., are being equipped with electrostatic precipitators to free the atmosphere of dust and smoke from oxygen-burning openhearths.

The move is a major phase in Bethlehem's multi-million dollar program for a cleaner atmosphere in the vicinity of the two plants.

Ready by Fall—At Sparrows Point the first precipitators are expected to be operating by October. At Lackawanna the initial units will go into service in September.

Under the new system, the waste gases or smoke from the oxygen furnaces—instead of passing directly into the stacks—will be drawn through the precipitators and the minute red dust-like solid particles removed instead of being released to the atmosphere.

How It Works—The dust-laden gases are passed through a high voltage electrical field where a negative surface charge is imparted to the dust particles. The negatively charged dust particles migrate to the oppositely charged collecting electrode where the charge dissipates and the dust is collected.

Furnaces Included—At Sparrows Point the six precipitators will clean the waste gases from seven openhearth furnaces in the No. 4 shop where oxygen lances are being installed.

The Lackawanna installation is basically similar to that at Sparrows Point.

Coal Injection Cuts Blast Furnace Costs

Use of coal injection to partially replace coke as a blast furnace fuel is proving out economically.

Operation of a solid fuel injection system on a commercial blast furnace has supported the findings of previous small-scale experiments. The commercial-sized installation—the first in history—is located at the Buffalo, N. Y., plant of Hanna Furnace Corp., a subsidiary of National Steel Corp. Bethlehem Steel Co. is also participating in the research venture with National.

Benefits Listed—Much additional experimental work remains to be done, according to Julius H. Strassburger, vice president—research and development, National Steel Corp.

But experience so far indicates these advantages of the process:

Substantial savings in cost of blast furnace fuel.

Additional savings from reduced investment in coke oven capacity.

Improved operating efficiency.

Higher production without increased furnace size.

Ability to use abundant lower quality non-coking coals instead of the scarcer and more costly metallurgical grade now needed in blast furnace operation.

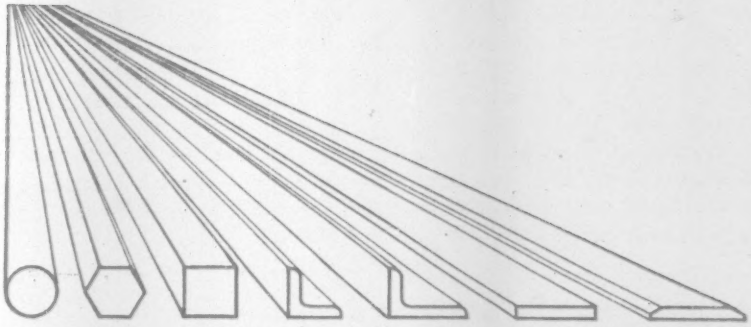
Substantial Savings—Direct savings from replacing coke with coal will vary with different blast furnaces because of location and other economic factors, Mr. Strassburger points out. But, he adds, in any case they should prove worthwhile.

How It's Done — Coal for the injection system is crushed and screened to minus ⅛ in. in size and conveyed by a vacuum system to an overhead storage tank. The coal is then passed under pressure from the storage tank to a charging vessel where it is kept in fluid condition by compressed air agitation.

Metered quantities of the coal are delivered from the vessel through a system of tubes to stainless steel lances at the tuyeres through which the coal is injected into the blast furnace.

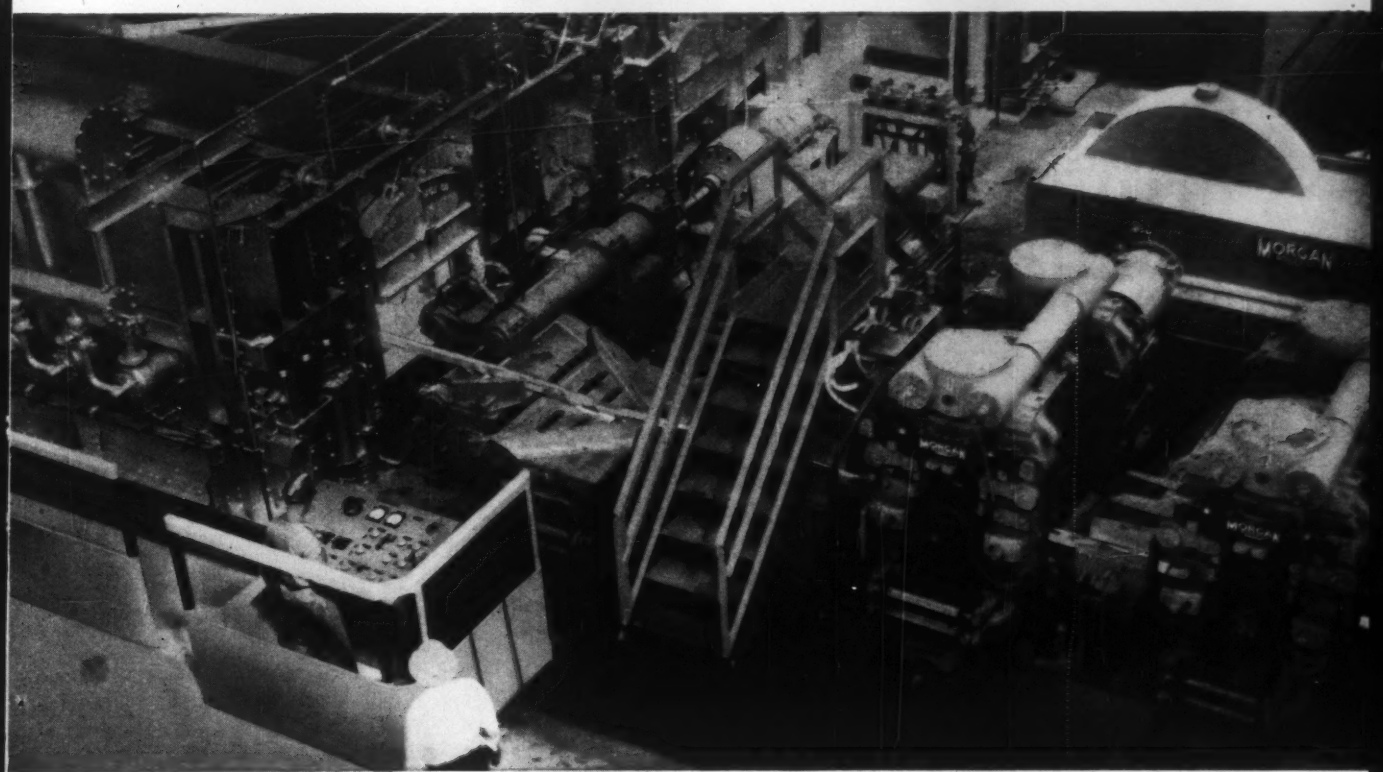
THE VERSATILE MILL WITH MARKETS IN MIND

Morgan Designed Mill for Sheffield has ability to Roll Wide Product Variety



ROUNDS • HEX'S • SQUARES • EQUAL ANGLES • UNEQUAL ANGLES • FLATS • BEVEL SKELP

Now rolling at three times previous production rate, the Morgan-built No. 2 rod mill in the Kansas City plant of Armco Steel Corporation's Sheffield Division was designed to turn out with equal efficiency any shape in the broad range of product demanded by current market trends. This example of Morgan creative engineering has gained world-wide recognition as the fastest 10″, 3-strand rod mill—proving again the operating benefits inherent in Morgan know-how and capabilities, accumulated in over 70 years of rolling mill pioneering.



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MORGAN CONSTRUCTION CO.

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ROLLING MILLS • MORGOIL BEARINGS • WIRE DRAWING MACHINES • COMBUSTION CONTROLS

INDUSTRIAL BRIEFS

Record Pipeline—Air Reduction Co., Inc., is building the longest nitrogen pipeline in the U. S. It will carry high purity nitrogen in large quantities to plants in the Delaware Valley chemical complex. It will originate at Airco's $6.5 million air separation plant being built at Claymont, Del., and cross the Delaware River into New Jersey along a 22-mile route.

New Dump Cars — Baldwin-Lima-Hamilton Corp. is building 40 dump cars of radically-improved design for Southern Pacific Railroad. The $882,000 contract is for cars specially designed to handle copper concentrates and similar highly viscous substances.

Water Conversion — An experimental 100,000-gallon-per-day sea water conversion plant at Southern California Edison's Mandalay Beach steam station is proving the feasibility of low-cost water conversion. Built by Aqua-Chem, Inc., Waukesha, Wis., it is converting water at less than $1 per 1,000 gallons. The unit required over eight miles of aluminum brass tubing and nearly 50 tons of steel sheet and plate.

Process Plant — Westinghouse Electric Corp. is supplying electrical equipment for the new Stora Kaldo plant of Sharon Steel Corp. at Farrell, Pa. It will be the first plant in the western hemisphere to use the Swedish basic oxygen steelmaking process.

Double Capacity — S. K. Wellman Co., Bedford, O., is completing an expansion program which doubles productive capacity of its metallic clutch plates, facings and brake block divisions. The company is also expanding its plant in Toronto, Ont., to serve the Canadian market.

Growth Program—Consolidated Vacuum Corp., Rochester, N. Y., has started a $500,000 expansion program. It includes addition of 23,000 sq ft to the manufacturing and research facilities.

Bigger Quarters — Kaiser Aircraft & Electronics Div., Kaiser Industries Corp., has begun a 50 pct expansion of the San Leandro, Calif., plant. It will handle increased production of rocket engine nozzles and missile and aircraft components.

Modernization Move — Bunting Brass & Bronze Co., Toledo, has started a foundry modernization program. It will include replacement of melting and molding equipment, a special dept. for small orders, and a precision plating dept.

Premier Casting — Koppers of Canada, Ltd., is building a two-strand continuous billet casting machine for Premier Steel Mills, Ltd., Edmonton, Alta. It will provide steel for 75,000 tons of finished products per year.

Branch Plant—Sprague Electric Co., North Adams, Mass., is opening a branch manufacturing plant at Hillsville, Va. It will turn out electronic and electrical components and semiconductors.

Name Change — Narda Ultrasonics Corp., Syosset, N. Y., has changed its name to Dynasonics Corp. It is a leading producer of ultrasonic cleaning equipment.

Two-in-One — Flight Sciences Laboratory, Inc., Buffalo, and Atlantic Research Corp., Alexandria, Va., have merged. Flight Sciences is engaged in research and advanced engineering in aeronautics and astronautics.

Southern Test—Wyle Laboratories, El Segundo, Calif., has opened a field engineering office and plans a testing laboratory at Huntsville, Ala. Wyle also has aerospace testing labs at Norco, Calif., and Westbury, N. Y.

Order Center—Curtis Industries, Inc., Cleveland, has transferred order-filling and shipping operations to a new plant at Eastlake, O. All stocks of keys, key machines, special tools and specialty products will be under one roof.

Full Owners — Lindberg Steel Treating Co., Inc., Melrose Park, Ill., has acquired Lakeside Steel Improvement Co., Cleveland.

Miniature Wafe—Miniature Precision Bearings, Inc., Keene, N. H., has acquired Wafe Manufacturing Co., Inc., Bridgeport, Conn. Wafe will continue to design and manufacture precision tools and dies as a division of Miniature.

Bigger Wheel — Geneva Metal Wheel Co., Geneva, O., is being acquired by Goodyear Tire & Rubber Co. Geneva makes a wide variety of disc, spoke and cast wheels.

Ohio Shift—Le Roi Div., Westinghouse Air Brake Co., is moving operations to the Sidney, O., plant. It will join manufacturing, sales and engineering functions that earlier shifted from West Allis, Wis.

TO FABRICATE STAINLESS WELD IT WITH AIRCO-MATIC

AIRCOMATIC® welding is the lower cost way to fabricate. Weldments show excellent ductility, tensile, and impact properties. Tailored to the process, Airco's wide range of Aircomatic stainless wires can be used for welding all standard alloy types. Remember: Only Airco makes everything you need for stainless welding.

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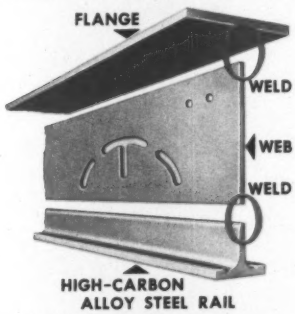
CLEVELAND TRAMRAIL
ANNOUNCES

TARCA TRACK

A MAJOR TRACK DEVELOPMENT FOR OVERHEAD MATERIALS HANDLING

Continuous automatically–controlled welds

Flange, web and rail joined by continuous automatic welds assure reliability.



Hard, raised, long-life treads

Rail especially rolled of high-carbon alloy steel for maximum durability. Treads are extra hard, raised, flat and smooth—for easy load movement—prevent peening—longer wear.

another exciting "first"

An outstanding advancement in a long series pioneered by Cleveland Tramrail to make it the leader in the overhead materials handling equipment industry. An entirely new track that had to be great to be better—result of years of research.

a far better track

Balanced design with parts proportioned exactly to provide maximum strength with minimum weight. Greater rigidity to withstand severe working conditions.

easier, faster to erect

Straight, true, smooth. All dimensions held to greater accuracy. Tarca Track matches with existing Cleveland Tramrail installations.

large range of sizes

10 standard sizes from 8″ to 20″ deep. Special sizes can be fabricated for unusual applications.

Ask for this helpful booklet—No. 2032

Covers all major features the buyer should know about overhead materials handling equipment. Has complete story on Tarca Track. Contains detailed equipment specifications and handy proposal evaluation form.

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THE CLEVELAND CRANE & ENGINEERING CO
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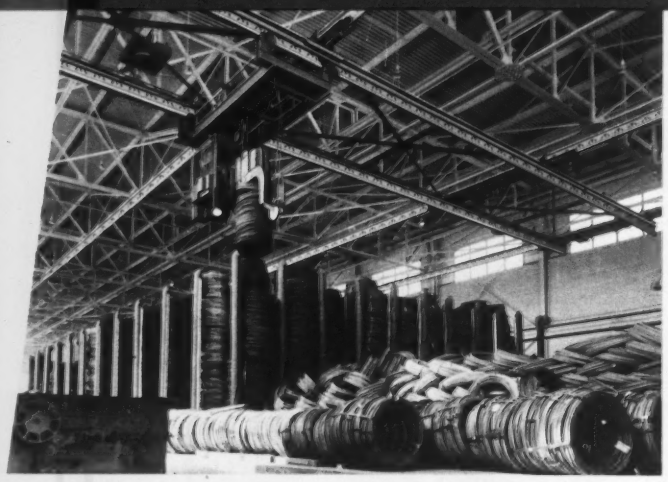
Most Installations of Cleveland Tramrail Equipment pay for themselves within one or two years.

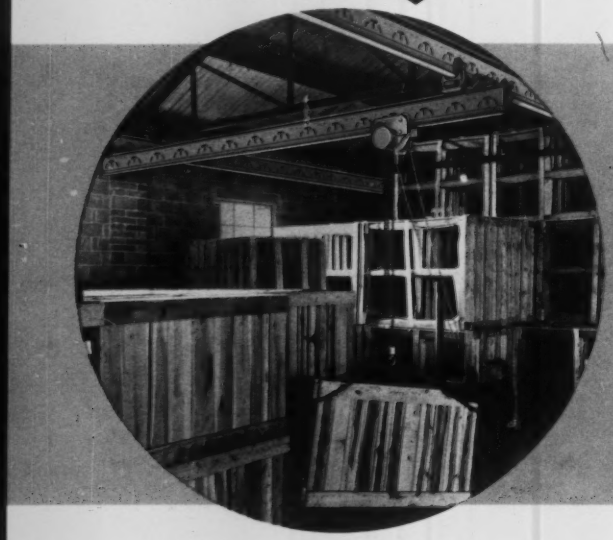
Trade—mark of durability and strength —punched into all Tarca Tracks.

One of the more recent important materials handling developments initiated and engineered by Cleveland Tramrail for the Wire and Rod Industry is the hydraulically-operated grab for storing coils in vertical piles. This device picks up several coils at a time and works in either vertical or horizontal positions.



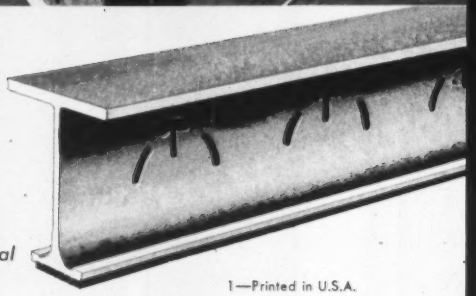
Simple inexpensive hand-propelled Cleveland Tramrail cranes are filling a mighty important need in a vast number of places. For instance, in this warehouse of a glass distributor, heavy awkward cases are handled by one man and piled high, thereby utilizing the storage space to the maximum.

Cleveland Tramrail gantry cranes have long been popular because they increase efficiency of many local handling situations. They will operate under overhead cranes without interference. Tramrail gantries are built in many types and sizes, with manual or electric drives.



Your Cleveland Tramrail Sales Engineer is Qualified to give you the Complete Design and Application Story on This Revolutionary

NEW TARCA TRACK



Cleveland Tramrail is represented by competent, experienced engineers in all principal cities of the United States and Canada. Contact address on other side.

1—Printed in U.S.A.

How to Understand Researchers

Despite all the talk, it's not true that the research scientist can't think in the same terms as management.

Actually the professional researcher and the manager have much in common.

■ Does the research scientist have a management attitude?

Much has been written on the subject, often pointing out the scientist does not think in management terms.

But the Battelle Memorial Institute has some encouraging views on the issue. In a new report, M. R. Nestor, Battelle's manager of project development, points out managers and researchers have much in common.

Probing Minds — One of the qualities shared by both groups: A high degree of creativeness.

Says Mr. Nestor, "The scientific mind is an inquiring one. In terms of industrial research it asks: 'Has this proposed study been accurately defined and oriented? Have the useful properties of this new material been exhaustively considered? Is the solution in unconsidered technologies?'

"Administrators would also ask such questions about research if they had the professional training to pose the proper ones. The management mind is also inquisitive . . . so the two have much in common."

Relate to Needs—"Scientists and engineers are all kinds of people with families and homes. It is natural they should relate newly acquired knowledge to their daily lives. They recognize the creature comforts and contributions to a better life which major breakthroughs in basic research make possible."

The average professional researcher wants to see the results of his work applied to industrial production and social betterment, Mr. Nestor observes.

"For this reason, he acquires a feel for economics and will not recommend proposed research projects, if technological and market factors indicate the research effort will not fill a real need."

Fresh Viewpoint—Various case histories are included in the report showing how research comes to management's aid. Many times the researcher can suggest a new line of attack.

One case involved a manufacturer who refined a waste material, then sold it as a refined by-product. Because the operation was not profitable, he came to Battelle looking for a solution in the fields of technology and engineering.

Battelle researchers believed the first areas to consider were marketing and economics. And market studies proved he should cease the waste-processing operation. Result: A more profitable market was found for the unprocessed waste material.

Have Conventions Any Value?

■ Industry objects to the government's view that conventions and meetings are strictly recreational and not legitimate tax deductions.

Businessmen oppose the Administration's proposals to close this so-called tax "loophole." They feel that the long-range damage to business growth, if meetings are curtailed, would outweigh any revenue gains to the U.S.

Why they feel this way is pinpointed in a letter which one industry association is circulating among its members.

Information Center—In part it reads: "It has been our experience that strong chapter activities, fostered by regular chapter meetings, have resulted in a stronger industry.

"Business programs developed by our chapters have done much to provide individual members with a practical method of exchanging information on a great variety of subjects.

"Accounting methods, materials handling devices, market information, industrial relations, and improved company management are only a few of the topics on programs at our chapter, regional, and national meetings.

"Without this exchange of information, we feel certain that our industry would not be able to meet its obligations to its customers as efficiently as it does now."

They "Go Together" For

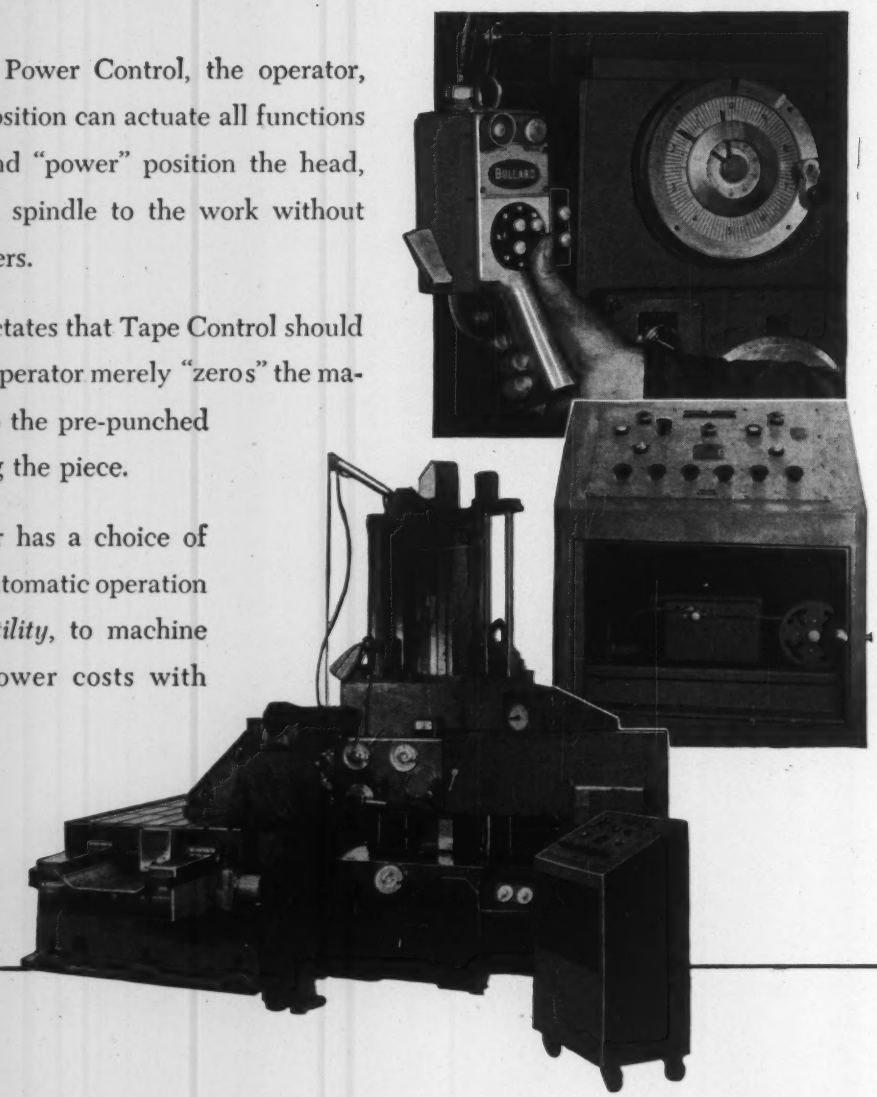
CENTRALIZED POWER CONTROL for manual operation and **NUMERICAL TAPE CONTROL** for automatic operation provide complete versatility of the Bullard DYNAMILL H.B.M. to insure maximum production.

Complete Versatility

With Centralized Power Control, the operator, from his normal position can actuate all functions of the machine and "power" position the head, table, saddle, and spindle to the work without hand cranks or levers.

When the work dictates that Tape Control should be employed, the operator merely "zeros" the machine according to the pre-punched tape for machining the piece.

Thus, the operator has a choice of either manual or automatic operation — *complete versatility*, to machine more pieces at lower costs with increased profits.



BULLARD

For Complete Information on the Bullard DYNAMILL H.B.M., call your nearest Bullard Sales Office or Distributor or write The Bullard Company, Bridgeport 9, Connecticut.

Ford Shows Fairlane and Meteor

Don't confuse Ford's Fairlane and Mercury's Meteor with the compacts. They aren't.

Fairlane is about the size of the '49 Ford, but has the space of the '59. And the Meteor is just a little bit bigger.
By A. E. Fleming

■ For an idea of what Ford Div.'s new Fairlane is like in size, look at a 1949 Ford and a 1959 Galaxie. Exterior dimensions of the 115.5-in. wheelbase Fairlane are very close to the '49 Ford. Interior dimensions and trunk space are about the same as the Galaxie of '59.

Why has Ford given its new line the old Fairlane name? Says I. A. Iococca, Ford general manager: "We can't kill the Fairlane name. There are too many Fairlane owners in the market. Besides, the public is getting all fouled-up in car names. There are so many different ones around already."

Which Will Go?—Ford executives aren't sure whether the Fairlane or the Galaxie will be the volume line next year. To start off, plans are to produce them in about equal numbers, then let the public take over from there. Production will start in October. Meteor, Mercury's 116.5-in. wheelbase version of the Fairlane, goes into production in November.

The new Lincoln is a twin to the 1961, except for minor changes. For example, the lower back panel applique is now in stainless steel. It was a zinc diecasting. Change was made to get a better texture match with the front grille.

Tops for T-Birds—There will be a pseudo two-seat Thunderbird in 1962. A fiberglass section is available that fits over the rear seats. It can be slipped on and off the car with little effort. A vinyl cover will also be offered for T-Bird hardtops to give a Landau appearance.

The new 221-cu in. V-8 engine for Fairlanes and Meteors is almost aluminum-free. The entire engine, in running condition, weighs 465 lb. Ford technicians say this will be pared to 450 lb during the production run.

One Ford engineer says the engine would have weighed 60 lb less in aluminum, but there would be a cost penalty offsetting weight advantages. He claims Buick and Oldsmobile pay a $200-per-engine penalty by using aluminum instead of cast iron in their compact-car V-8. "Why do you think Buick's coming up with a cast iron V-6." he asks.

Olds: Long Illusion

Oldsmobiles will look quite a bit longer in 1962 than in 1961. But the increase in length is less than two in. Stylists have created the illusion by severely squaring both the front and rear, plus adding chrome running lengthwise along the sides.

After a year of using an aluminum engine in the compact F-85, what does the division think of the future of the aluminum engine?

Matter of Cost—J. F. Wolfram division general manager, says: "Down the road, the aluminum engine holds promise. But it's a matter of cost. Aluminum was vital to the F-85 engine because we had to save weight. The weight factor isn't as vital in our big cars."

Mr. Wolfram believes that "costs have to be brought into control in casting" before big cars get an aluminum engine. Oldsmobile's chief engineer, H. N. Metzel, estimates aluminum engines cost about 25 pct more than cast iron. Even so, Olds will stick with the aluminum V-8 for all F-85's in 1962.

Cardinal Wears a Swedish Hood

Ford Motor Co. is trying out engine and mechanical components of the Cardinal in two Saab automobiles in Detroit.

This may give a clue as to the size of the Cardinal, which will be Ford's answer to Volkswagen and other small imports. The Saab, a front-wheel drive car made in Sweden, has an overall length of 158-in. It has a 98-in. wheelbase. Estimates of the Cardinal's wheelbase have ranged from 90 in. to 100 in.

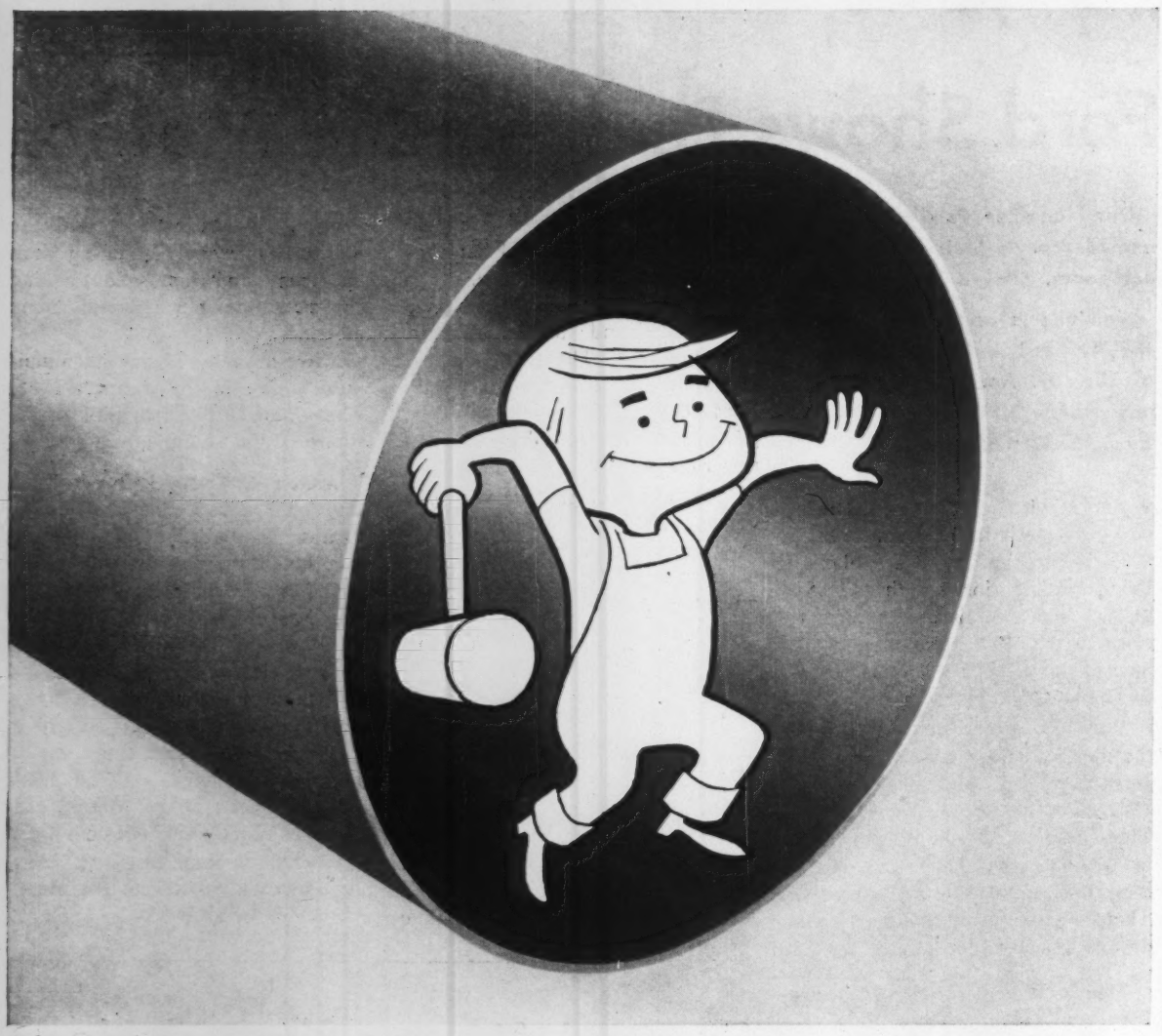
Family Resemblance—Engines under test in the Saab's have 70-cu. in. displacements. Horsepower is estimated at 40 to 50, with the latter more likely.

There is a completed Cardinal at Ford's test track in Dearborn, Mich. Body lines are on the straight side. This gives the car a family resemblance closer to the new Fairlane than to the Falcon.

What's Up Front—The engine is water-cooled. This places the radiator along the side of the engine compartment rather than in front.

The unit-body Cardinal has front-wheel drive, just like the Saab. The suspension system includes coil springs in the front, leaf springs in the rear.

The car is said to handle very well for its size. But there is a problem of rear-end breakaway on wet pavement.



"The Gravity Kid" shows why

CONTOUR-WELDED TUBING OFFERS GREATER FATIGUE STRENGTH, LONGER SERVICE LIFE

Tubing fatigue strength depends largely *on how the tube is welded,* and the results obtained. Tubing that's smooth inside – free of flaws and bulging weld beads – offers much greater fatigue strength and longer service life.

Contour-welded* *tubing is smoother inside* than conventionally-welded tubing. It's smoother because *it's welded at the bottom.* Gravity pulls the metal down so that the weld corresponds to the tube's inside contour. There's no bulge on the inside surface. Even on the outside, the seam closely conforms to the tubing shape.

Contour-welding provides greater strength than conventional welding, because in conventional welding, gravity pulls the molten metal down into the tube. This can form a bead that is difficult to remove by cold working. And cold working can lead to deep, sharp undercuts that seriously weaken the tube.

Contour-welded tubing is smoother than seamless, too. That's because it's formed from uniformly rolled strip steel; whereas, seamless is produced by extruding or piercing. This strip is 100% inspected. So, there are no undetected tears or fissures inside.

See for yourself why Contour-welded tubing offers greater fatigue strength, longer service life. Write today for our free 48-page manual which describes tubing sizes from 1/8″ to 40″ O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy, and Hastelloy**.

*U.S. Patent 2,716,692

**Trademark Haynes Stellite Co.

TRENTWELD® Stainless and High Alloy Tubing

Trent Tube Company, a Subsidiary of Crucible Steel Company of America, General Offices and Mills: East Troy, Wisc.; Fullerton, Calif.

Bonanza: Auto Anti-Smog Device

There's gold in the middle of the highway just waiting for someone to find an acceptable way to extract it commercially.

It's estimated that California offers a $1 billion market for a workable anti-smog device.
By R. R. Kay

■ Behind the scenes, there's feverish work going on to perfect anti-smog devices for cars.

The first companies that come up with California-approved smog-eaters are sure to strike a bonanza. The market for these devices in California could hit $1 billion.

The state's battle to lick auto smog may well affect the world's motoring public. Right now, there's international interest in this pioneering program. Air pollution authorities all over the world have their eyes on California.

Smog Screen—Here's an up-to-date rundown on what's going on:

The California Motor Vehicle Pollution Control Board keeps screening exhaust control devices. Of the twenty-four already submitted, it has turned thumbs down on sixteen. Only one is going into first-step testing.

Box score of companies in contention: Chromalloy, W. R. Grace, Oxy-Catalyst, Arvin Industries, Standard Products, Universal Oil Products, Calumet and Hecla, and McAlester Aircraft.

Hue and Cry—Right now, there's a lot of talk in California whether to go ahead and certify crankcase control devices while exhaust control devices are being perfected. Some experts say the crankcase approach would immediately cut by 20 pct the eye-burning auto-caused air pollution. Others feel that two different devices would only lead to confusion and delay.

Secretary of Health, Education, and Welfare Ribicoff is urging automakers to put crankcase devices on their 1964 cars. He plans to ask Congress for legislation if the automakers don't move fast.

Gas Expands in West

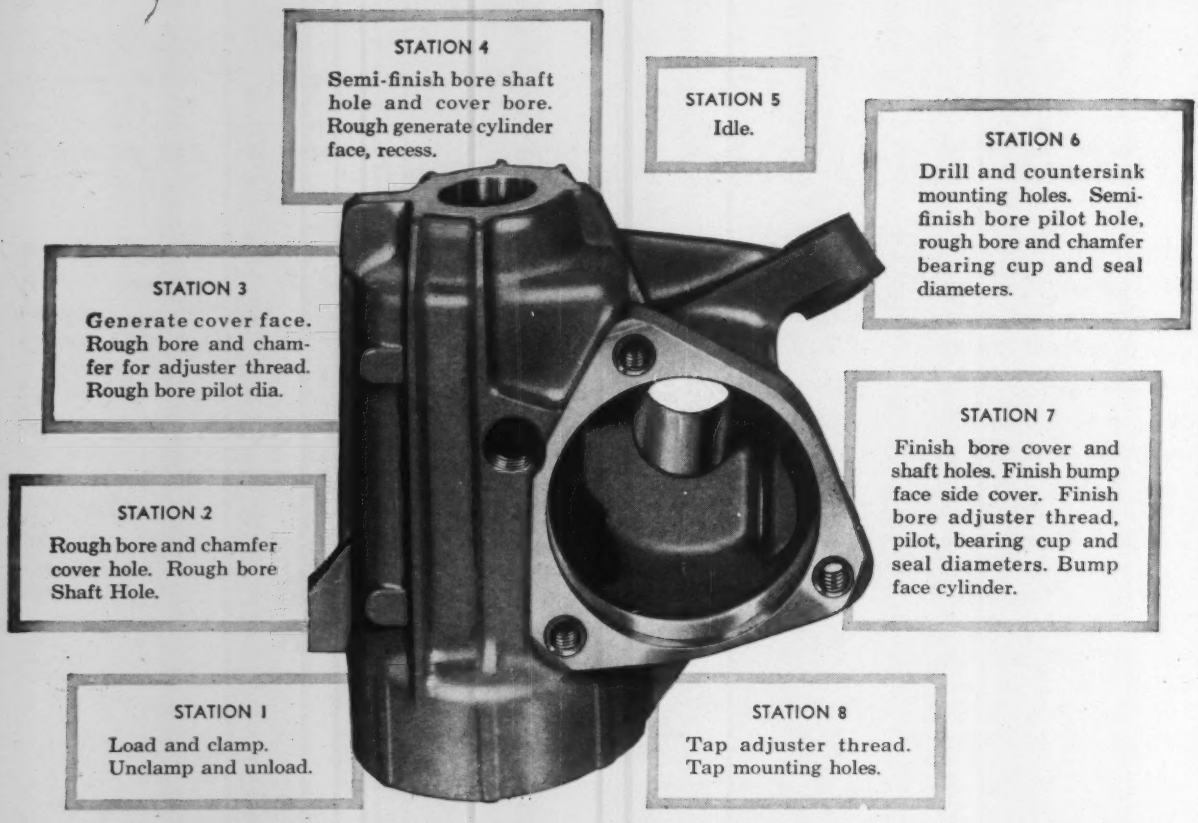
Another $2-billion plus market in the natural gas industry. For the fifth straight year, that's what the industry will spend for new and expanding facilities. Demand for the fuel runs high.

The accent is still on the Farwest—all the way from the Canadian border to Mexico. Huge projects are in the works.

Here's how the budgets for top gas companies shape up: Gas transmission, $1.046 billion; gas distribution, $644 million; storage—peak shaving, $131 million; production and gathering, $106 million; general expenditures, $77 million; automotive and construction equipment, $20 million.

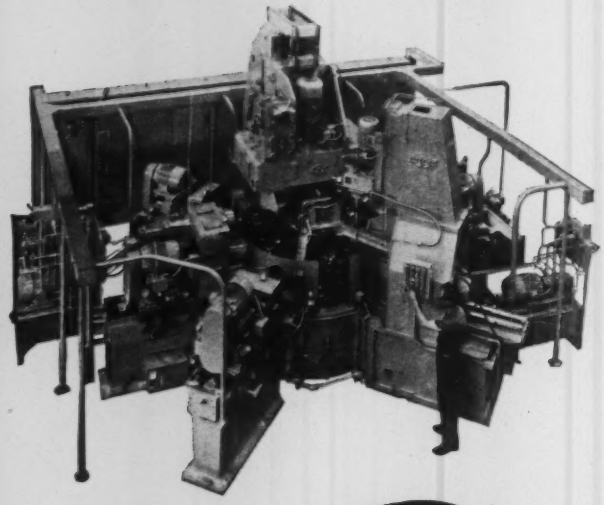
Giant Rocket Engine Undergoes Test

PLENTY OF PUSH: More than 1 million lb of thrust streams from F-1 rocket engine being developed by Rocketdyne Div. of North American Aviation, Inc. Eventually it will produce a thrust of 1.5 million lb.


STATION 4
Semi-finish bore shaft hole and cover bore. Rough generate cylinder face, recess.
STATION 5
Idle.
STATION 6
Drill and countersink mounting holes. Semi-finish bore pilot hole, rough bore and chamfer bearing cup and seal diameters.
STATION 3
Generate cover face. Rough bore and chamfer for adjuster thread. Rough bore pilot dia.
STATION 7
Finish bore cover and shaft holes. Finish bump face side cover. Finish bore adjuster thread, pilot, bearing cup and seal diameters. Bump face cylinder.
STATION 2
Rough bore and chamfer cover hole. Rough bore Shaft Hole.
STATION 1
Load and clamp. Unclamp and unload.
STATION 8
Tap adjuster thread. Tap mounting holes.

153 Aluminum Steering Gear Housings per hour

automatically processed on this GREENLEE Machine



This Greenlee 8-Station Horizontal and Vertical Spindle Machine is establishing some excellent performance records for a leading automotive manufacturer. The 52 inch table carries 8 work fixtures. Each has power clamping. To insure rigidity and accuracy, the table is clamped hydraulically metal to metal. Indexing is fully automatic. Cycle time is 23.5 seconds. Like all Greenlee machines it's built for long, continuous service. Can be modified economically if desired. Have our representative give you complete information.

MACHINES DESIGNED
WITH THE FUTURE IN MIND

PRODUCTION MACHINERY

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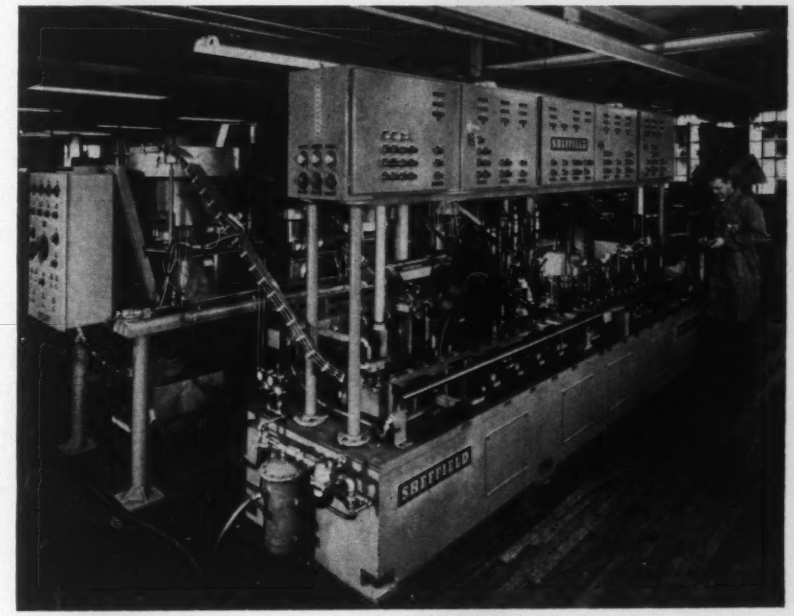
Defense Tooling Is Crisis-Keyed

Output May Be Increased on Very Short Notice

Military tooling technicians are plagued with a problem: Normal output in peace-time, but overnight gains if war threatens.

Special equipment is needed to meet this challenge.
By R. H. Eshelman



NEW TREND: The military is becoming aware of the need for faster defense production. An example is this push-button assembly line in use by Stewart-Warner Corp. It was built by Sheffield Corp. and assembles nine parts in sequence for an ordnance component at a much faster pace.

■ Keeping prepared for defense emergencies places ever greater strains on military and supplier organizations. And military production problems are complex and fast changing.

In peacetime, only prototype or low volume production may be justified on many items. But military planners must be prepared to swing into added output on little notice. What are some ways to meet this challenge?

Here's How—One is a focus on numerical controlled machines and computer designed parts. Also, electronic data processing of decision-making paperwork; engineering and release systems; production and materials controls, etc. Another is to mothball virtually automatic production lines for key items such as the M-14 automatic rifle. These may run off token production from time to time, to insure good operating conditions.

With this constant research to provide more effective hardware at less cost, ranging from small arms weapons to advanced aerospace vehicles, Army ordnance looks unceasingly for more advanced production systems.

Keeping Abreast — Various factors are weighted against current tooling on hand in storage and on layaway production lines. Industrial specialist staffs in the different ordnance districts follow manufacturing technology with frequent engineering studies. They dispose of obsolete tooling inventory.

Max P. Stromer, industrial specialist, Detroit ordnance district, U. S. Army Ordnance, a long-time veteran in this field, notes: "In case of M-day, we are in a good position to go into production immediately. We have lines ready to go into plants in 48 hours, along with tentative production schedules."

Thus, weapons systems and related production plans in this country are modernized faster and more efficiently than ever before. Changes that cannot be disclosed have been made even within the last few months.

Faster Work—Example of this advanced thinking: A new automatic assembly machine developed by Sheffield Corp. It puts together nine parts of an ordnance component far faster than previously possible. Five of the parts go on the base in a progressive sequence. Then the sub-assembly is flipped over and three more pieces added. The unit even self-tests critical components. If they fail the assembly is kicked out automatically.

Jamming or failure of an assembly cycle also means ejection of the partially completed unit. Operators use a special sequence time recorder to put all the various split-second operations in phase. This simplifies and greatly speeds production.

MEN IN METALWORKING

W. A. Brown, elected chairman of the board of directors, R. D. Wood Co.

Ford Motor Co.—N. E. Rothenthaler, named general manufacturing manager, Steel Div.

Gevaert Co. of America, Inc.—Claude Maillard, appointed manager, Industrial Sales Dept.

Lansing Stamping Co. — S. N. Johnson, elected executive vice president.

Radio Corp. of America—J. E. Johnson, appointed staff vice president.

Borg-Warner Corp.—E. S. Russey, elected chairman of Borg-Warner Ltd., Letchworth, England.

Towne Robinson Nut Co.—F. S. Napoli, appointed vice president, manufacturing.

S. K. Wellman Co.—W. E. Canfield, elected to the board of directors.

Astron Corp.—P. M. Maler, appointed vice president, manufacturing.

Atlas Chemical Industries, Inc.—R. P. Barnett, appointed vice president.

Clark Equipment Co. — George Plaut, appointed manager, industrial relations.

Climax Molybdenum Co.—Barry Crowston, appointed asst. director, technical information for the division of American Metal Climax, Inc.

Oswald Refractories Co., Inc.—R. E. Oswald, elected a vice president.

Electric Storage Battery Co.—V. G. Zeller, elected vice president, foreign operations.

Electric Autolite Co.—P. F. Allmendinger, appointed director of engineering, electrical products group.

Fidelity Chemical Products Corp.—B. M. Levison, appointed technical director.

F. W. Stakelbeck, elected president and chief executive officer, R. D. Wood Co.

Sunbeam Equipment Corp.—Willard Roth, appointed engineering manager; N. J. Acker, appointed asst. engineering manager.

Great Lakes Steel Corp.—L. W. Bache, appointed asst. to the president; P. W. Hacala, named asst. treasurer; J. G. Mancos, named manager, Cost Accounting Dept. and A. E. March, named asst. manager, Cost Accounting Dept.

Keystone Steel & Wire Co.—J. G. Weiss, named director, wire mill development.

Kaiser Aluminum & Chemical Corp.—G. C. Davis, Jr., appointed director, technical planning, and R. E. Pardee, appointed manager, technical services, Kaiser Refractories & Chemicals Div.

(Continued on P. 79)

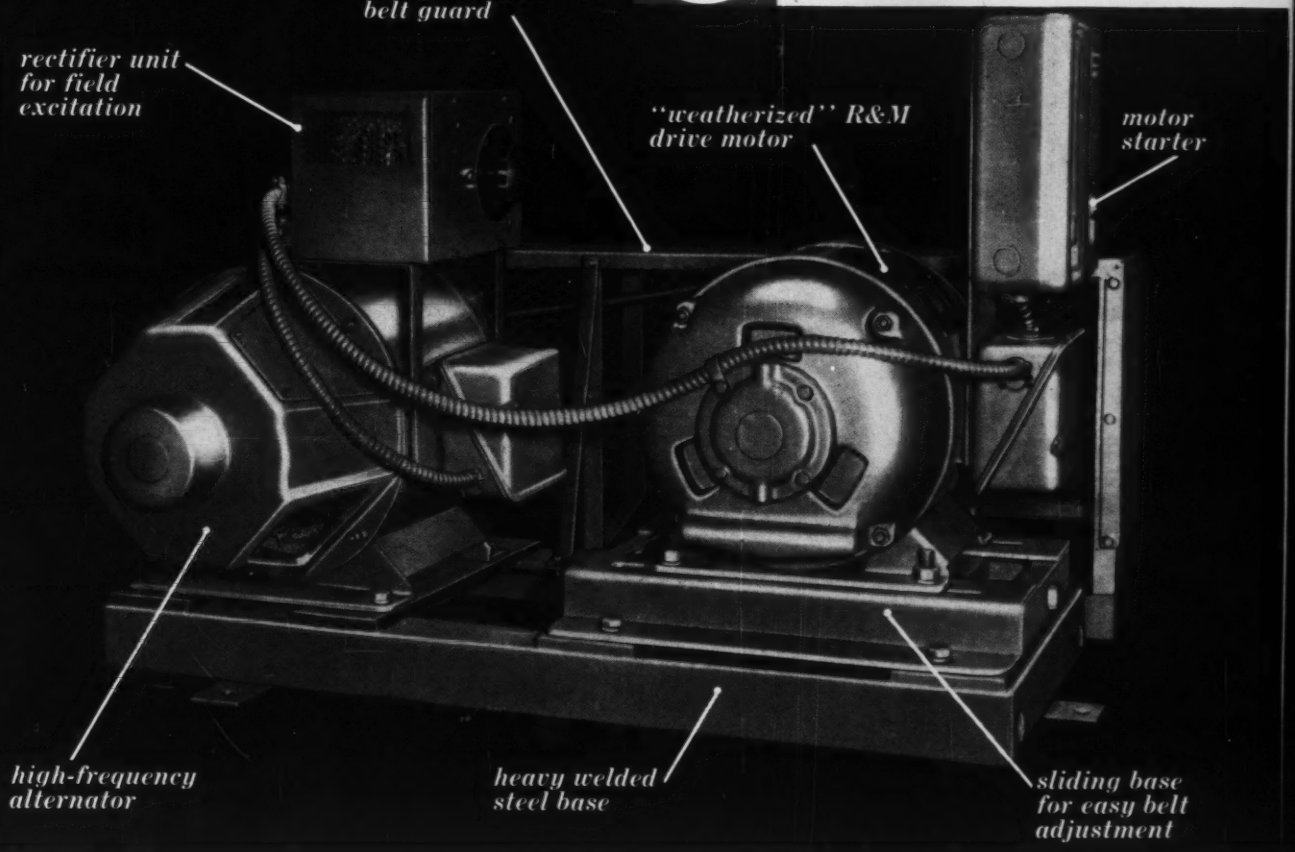
Galen Miller, named president, Towmotor Corp.

R. L. Fairbank, named executive vice president, Towmotor Corp.

R. S. Sheetz, elected executive vice president, Ohio Crankshaft Co.

high frequency

Generators, Converters



Compact High Frequency Power Generators

360 to 3300 cycles

R&M package high cycle generators provide dependable current beyond the practical range of frequency converters. Rugged revolving field construction is used in ratings of 1500 cycles and lower. Ratings above 1500 cycles are brushless inductor design. Excitation of DC alternator field is provided by simple silicon rectifiers, protected against short circuits by time-delay fuses. For changing output frequency, R&M can furnish variable pitch pulleys or variable speed drives. R&M's low-cost frequency converters make 220 volt-3 phase-120 through 420 cycle power available from 60 cycle supply . . . rated 2½KW (horizontal construction) 5, 7½ and 10KW (vertical).

Write today for bulletin 515A-IA!

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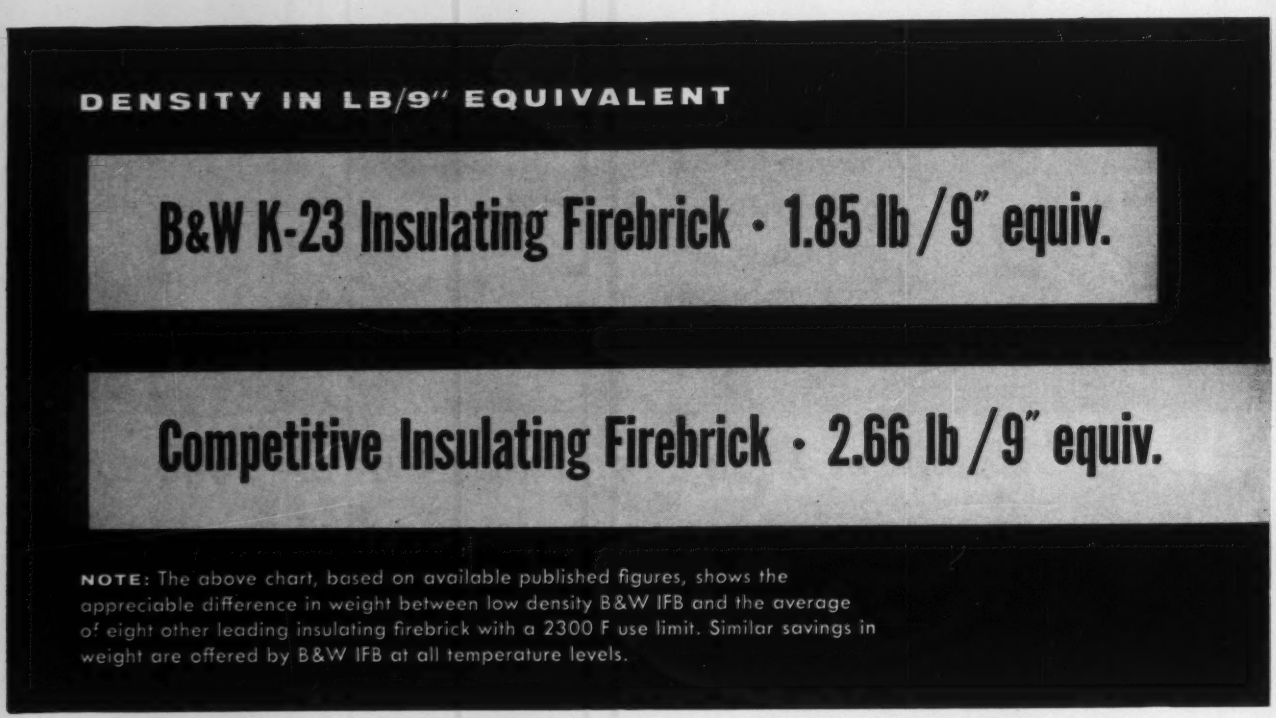
Fractional and Integral HP Electric Motors • Electric Hoists and Overhead Traveling Cranes • Moyno® Industrial Pumps
Propellair® Industrial Fans • R & M-Hunter Fans and Electric Heat • Trade-Wind Range Hoods and Ventilators
Subsidiary companies at: Memphis, Tenn., Pico Rivera, Calif., Brantford, Ontario.

Another *plus* of Lightweight B&W Insulating Firebrick

LOWER DENSITY means


DENSITY IN LB/9" EQUIVALENT
B&W K-23 Insulating Firebrick · 1.85 lb/9" equiv.
Competitive Insulating Firebrick · 2.66 lb/9" equiv.
NOTE: The above chart, based on available published figures, shows the appreciable difference in weight between low density B&W IFB and the average of eight other leading insulating firebrick with a 2300 F use limit. Similar savings in weight are offered by B&W IFB at all temperature levels.

All insulating firebrick are not the same. Published figures show wide variations in *all* of the important properties among the leading brands of IFB.

Take density. This important property, related to the porosity and the light weight of the brick, affects furnace weight, construction costs, fuel costs, and temperature control. Densities range from a B&W Insulating Firebrick low of 1.85 to a high of 2.80 per 9 inch brick for a competitive Insulating Firebrick—*approximately a 35% difference in dead weight and insulating efficiency.*

You are paying for *insulating* firebrick . . . make sure you get *all* the benefits. B&W—the originator of IFB—manufactures a full line of IFB with an experience-proved balance of light weight, high insulating value, high strength and long life.

For complete information on B&W Insulating Firebrick, write for Catalog R-38 to The Babcock & Wilcox Company, Refractories Division, 161 East 42nd Street, New York 17, N. Y.

ONE OF A SERIES

LESS FURNACE WEIGHT

the payoff

9 TONS LESS WEIGHT to heat and lift in this hood-type, 8 stack annealing furnace. Lined with B&W IFB at 1.85 lb per 9" straight, the refractory lining of this furnace weighs 37,000 lb as compared to 55,200 lb for *average weight competitive IFB*. 33% less weight to heat and lift when you specify B&W IFB. This is just one of many proofs in our files that "there is an important difference in insulating firebrick."

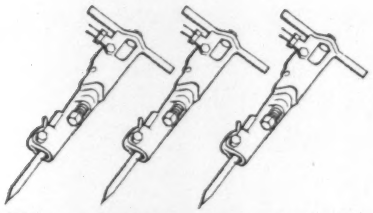
B&W

THE BABCOCK & WILCOX COMPANY

REFRACTORIES DIVISION

R-859

The Porter Alloyist delivers the right alloy IN THE SPOTS THAT COUNT

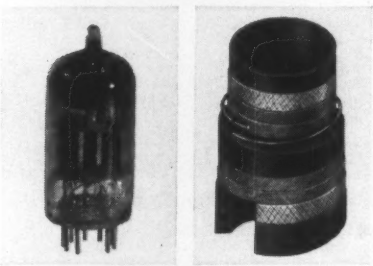


There can be no compromise in metals for those tougher, tool-killing jobs. That's why the Porter Alloyist recommends Grade D phosphor bronze for the rifle nut in air hammers . . . the critical part of the tool that absorbs hundreds of vibrations a minute at high impact pressure. Produced at a special temper, this alloy has the required toughness and durability to do the job and to help keep tool maintenance costs low.

THE PORTER ALLOYIST IS A SPECIALIST IN A WIDE RANGE OF SPECIAL METALS

Porter's Riverside-Alloy Metal Division is your single reliable source for specialty alloys in 8 basic groups of wire, rod and strip . . . phosphor bronze, nickel silver, cupro nickel, brass, stainless steel, nickel, Monel and Inconel.

Ask for a free copy of "Alloys for Industry" describing our wide range of specialty alloys. Write H. K. Porter Company, Inc., Riverside-Alloy Metal Division, Riverside, N.J. Or contact our sales offices in Hartford, Chicago, East Orange, Atlanta, Cleveland, Detroit, Cincinnati, Los Angeles and Rochester.



PORTER nickel wire is used extensively in vacuum tubes and in other components for the electronics industry.

PORTER carbon steel wire reinforces hose for air hammers and other industrial equipment.

PORTER

RIVERSIDE-ALLOY METAL DIVISION
H. K. PORTER COMPANY, INC.

(Continued from P. 74)

Daystrom, Inc.—G. V. Gerber, appointed chief components engineer.

Consolidated Electrodynamics Corp.—L. H. Frandsen, appointed director, defense contracting.

Cohu Electronics, Inc. — S. S. Sievers, named regional sales manager, Kin Tel Div.

Bailey Meter Co.—A. J. Hornfeck, appointed director, research; J. E. McEvoy, appointed manager, product engineering dept.; R. E. Clark, appointed manager, equipment engineering dept.; J. K. Loeser, appointed manager, project engineering dept.; J. V. Werme, appointed manager, electrical engineering dept.

American Can Co. — W. B. Bruce, appointed manager, sales promotion, Canco Div.

Bendix Corp.—J. P. Field, named director of programs; E. F. Lapham and T. S. Torian, named program managers; J. A. Reed, appointed contracts manager; D. A. Tuttle, appointed estimating manager, Mishawaka Div.

Revere Copper & Brass Inc.—J. S. Pickard, Jr., appointed district manager, Dallas, Texas.

Dover Corp.—R. M. Klaus, named director, purchases, OPW Div.

Hanson-Whitney Co. — F. H. Gustafson, appointed supervisor, field engineering.

Kelite Corp.—R. J. Racine, appointed national sales manager.

Wesson Corp.—R. W. Berry, Jr., appointed chief engineer.

Peterson Steels, Inc. — H. R. Robson, appointed sales representative, Southeastern Pennsylvania, Maryland, and Delaware.

Crucible Steel Co. of America—J. F. Gallo, appointed manager, casualty insurance.

Ipsen Industries, Inc.—C. W. Brunstetter, appointed general manager.

J. P. Zur, appointed vice president, engineering, Sunbeam Equipment Corp.

Union Carbide Corp. — R. S. Abrams, appointed manager, development, Union Carbide Olefins Co.; and J. C. Malone, appointed general manager, Silicones Div.

Colorado Fuel and Iron Corp.—F. C. Broadway, appointed traffic manager and R. A. Anderson, appointed asst. traffic manager, Colorado Div.

Carpenter Steel Co.—C. E. Miller, appointed Houston district manager, Superior Steel Div.

Copperweld Steel Co.—John Ufner, named Detroit district sales manager.

Republic Steel Corp.—P. A. Baxter, named district sales manager, Berger Div. sales offices in Baltimore, Md.; J. R. Sally, appointed asst. manager, Chicago sales district; R. C. Gardner, named asst. superintendent, coke plant, Chicago District steel plant.

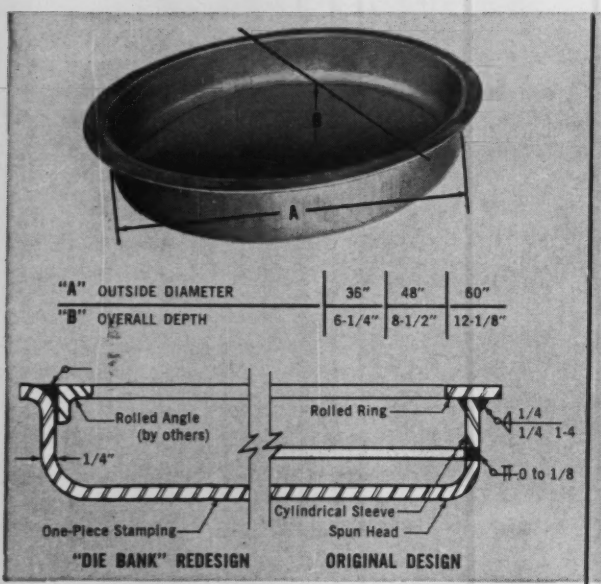
Wheeling Steel Corp. — F. J. Howie, asst. manager, Tubular Sales Dept.; E. F. Schulz, named manager, Wheeling district sales office.

Midwest Steel Corp. — E. W. France, appointed asst. to the general superintendent; W. E. Rueter, appointed plant industrial engineer.

Speakman Co. — W. G. Oslin, appointed executive vice president and general manager.

Superior Parts at Lowered Cost with This Fresh Approach to Stamping

Many parts in use today are better as a result of design refinements suggested by COMMERCIAL's stamping experts. The examples below demonstrate how these design refinements have resulted in superior parts for the OEM at lowered cost. These examples may appear to you as unusual in design and this is the point...

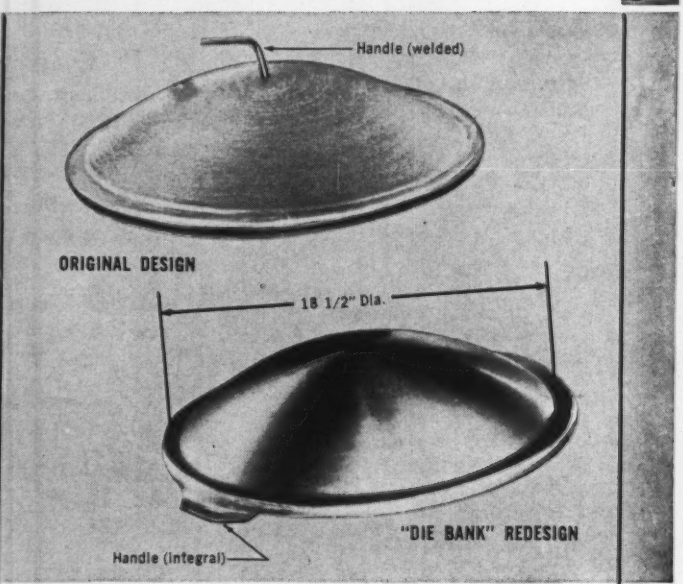


One Piece Stamping... Improves Appearance, Replaces Three Piece Weldment

Circular steel boiler doors 36", 48", 60" diameter were formerly fabricated from three basic components—spun head, cylindrical sleeve and ring rolled the hard way.

Problem: eliminate accumulative assembly variables caused by inherent non-uniformity of three components—upgrade product appearance.

Solution: one piece smooth surface COMMERCIAL steel stamping shaped in a die assembled from stock "die bank" components (for details of "die bank", see box upper right). Stamping tolerances plus or minus 1/16" (flat across flange within 1/16"). Result—accurate finished product because former difficult assembly and time-consuming fitting-up problems eliminated. All outside exposed welds (about 16 ft. on the 48 in. side) and grinding discontinued. An end product with improved appearance—better product appeal.



Stampings... Unitize Construction, Replace Inaccurate Stainless Steel Spinnings

Original contruction of bulk milk cooler used tank manhole cover spinning—requiring welding, grinding and polishing.

Problem: reduce production finishing time, overcome welding heat distortion of stressed metal-spinnings, increase strength, produce uniform parts and improve sanitation properties.

Solution: COMMERCIAL's "die bank" proved a nucleus for a one-piece stamping redesign including integral handles. Basic stamping details—size, shape and gauge were tailored to stock die components. Realization—smoother finish of stamping creates a more sanitary, better appearing tank. Closer tolerances of stamped cover provide flange with definite "drop-on" vacuum seal. Fewer parts resulting from stamping. Unitization greatly diminishes production time and component cost.

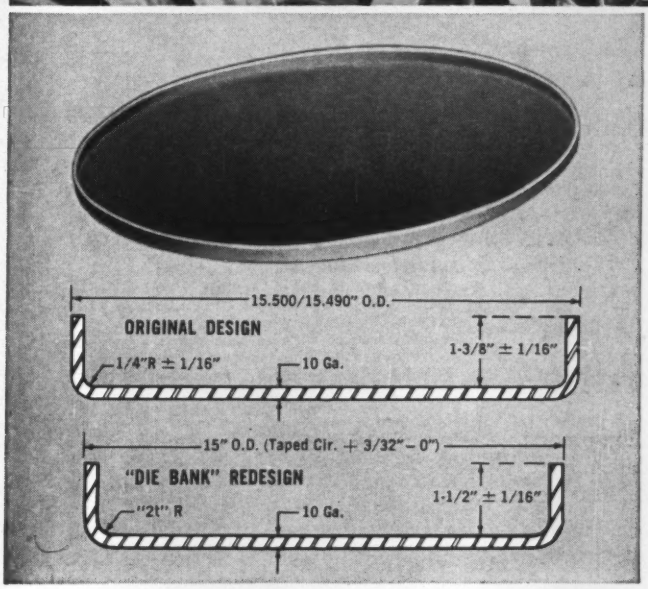
"Die Bank" Facts

Over 50,000 stock die components stand ready to go to work for you at COMMERCIAL. These components can be combined in endless variety—can prove, as they have for others, invaluable in your stamping design.

Components for circular stampings cover a diameter range from 2½" to 72". To 30" O.D., increments are in units of 1". Over 30" O.D., increments progress from 1" up to 6" for the largest diameter. Under 24" O.D., many sizes are available in fractional inches.

Stampings from these die components range from 20 gauge to ¾" thick. Contour can be flat or dished to any one of many patterns. Stampings can be supplied with vertical, horizontal or reverse flanges—or without any flange.

Use of COMMERCIAL's "die bank" results in many stampings made to basic original design free of heavy tooling cost—minor design latitude often eliminates all die expense. Catalog 200-C1 "Standard Metal Shapes" should be in your hands when preliminary designs go on the board.



"Die Bank" Stamping Gets O. K. . . .
Reduces Cost of Tailored Design

Original design of agriculture combine cylinder head called for odd fractional dimensions. Tolerances were tighter than necessary and applied in conflict with best stamping practice. Details were established without knowledge of COMMERCIAL's "die bank". Result—high unit cost to produce basic part to individually tailored size. Special dies, not in existence, were required.

Problem: redesign a more practical part to be mass produced at low unit-cost—eliminate special die cost.

Solution: simple redesign using stock die components from COMMERCIAL's "die bank" cancelled out $1850 partial die cost required for tooling original design. Net die cost: zero. Piece price reduced: 16 cents. Savings on initial requirement: over $2200. A stamping made to commonly accepted tolerances at lower cost without sacrificing product quality was the answer.

Advantages of Stampings

Economy of production
—metal conservation, waste material minimized, stamped parts have greater surface area than blank the part is made from—without loss in strength
—high quantity man-hour output from fast production machines—low unit cost

Greater strength: predicted, controlled, unvarying
—higher proportionately, in relation to weight, than possible in other metalworking processes

Enhanced appearance: finish is predictable, uniform, "as specified"
—multiple selection of basic material and its finish facilitates maintaining appearance in stamping the part or its further processing

Features of COMMERCIAL Stampings

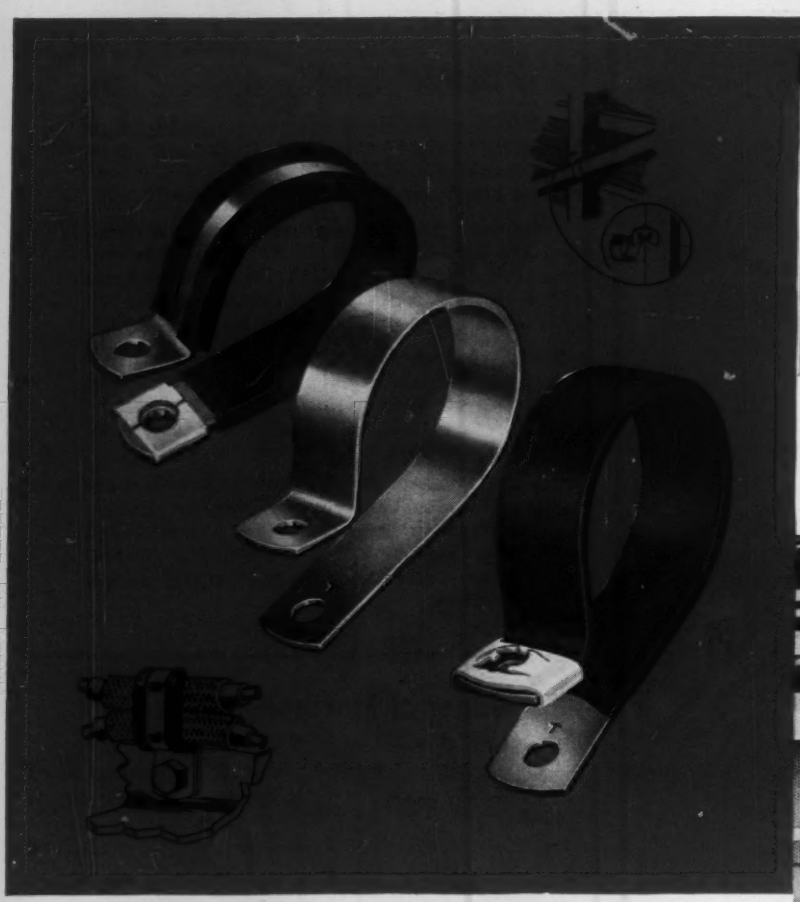
Specialized equipment
—modern presses with capacity over 2000 tons; facilities located in three strategic metal producing centers

Economical large or small runs
—medium to heavy, shallow or deep drawn stampings

Facilities for finishing
—drilling, boring, tapping, machine trimming, burning, welding, painting, etc.

While designs are on the board, or redesign of parts in usage are fresh in mind, why not call on COMMERCIAL'S technical service—send print, sketch, sample or prototype. Address: Commercial Shearing & Stamping Company, Dept. K-35, Youngstown 1, Ohio.

COMMERCIAL
shearing & stamping



A T-Marked SPEED NUT Brand Fastener...

SPEED CLAMPS® go on fast, trim weight and parts handling

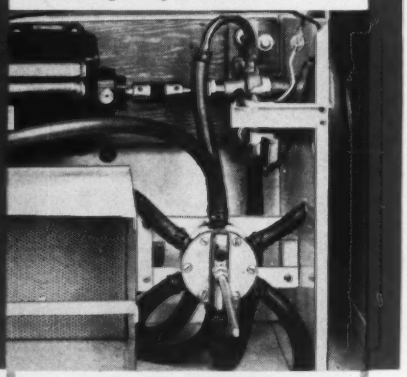
Attachment of tubing is fast and simple with vibration-proof Tinnerman SPEED CLAMPS. They are available in a wide range of sizes and types, with or without attached SPEED NUTS or neoprene flame-resistant cushions. They make firm, secure attachments and allow substantial savings in weight, assembly time and costs.

The complete line of Tinnerman SPEED CLAMPS includes hose clamps, tube clamps, harness clamps, and an assortment of special types to meet various requirements.

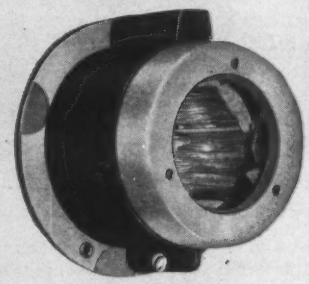
When buying clamps or spring-steel fasteners, look for the T-mark...your assurance that you're putting Tinnerman quality and total reliability into your products. For samples, literature, prices call your local Tinnerman Sales Office . . . listed in the "Yellow Pages" under "Fasteners." Or write to: *Tinnerman Products, Inc., Department 12, Box 6688, Cleveland 1, Ohio.*

T-MARK ENGINEERED SPECIALS

TIME SAVING was the benefit when this Tinnerman Harness Clamp was used to fasten wire bundles to an aircraft structure. Inset shows safe, interlocking tongue and slot that can't spring open accidentally, yet opens readily for servicing without removing clamp from bulkhead.



ASSEMBLY SIMPLIFICATION resulted from a switch to Tinnerman Hose Clamps in this oil changer. One-piece SPEED CLAMPS are easy to apply, quickly secured with standard pliers. Savings in time and labor are substantial, excessive weight and parts handling are eliminated.



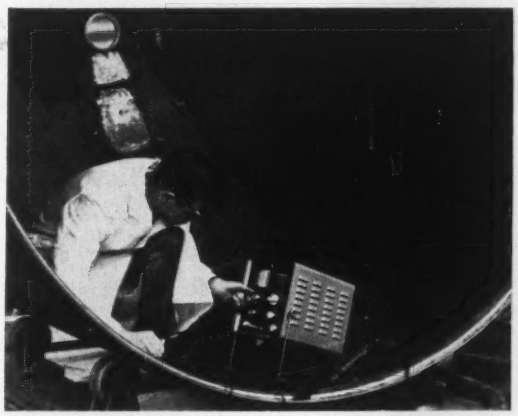
GREATER RELIABILITY is attained by television manufacturers with Tinnerman Deflection Yoke Clamps. They eliminate the problem of misalignment and broken connections resulting from rough handling, cushion the tube assembly under live spring tension.

TINNERMAN *Speed Nuts*®
Look for the Tinnerman "T"

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S.A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano Simmonds GMBH, Heidelberg.

Solid Segment Takes Shape

An ultrasonic device checks the wall thickness of the forward head of the world's largest and most powerful solid-fuel rocket engine. The ring attached to the component's edge is part of Aero-



SONIC CHECK: Reveals wall thickness.

jet General's segmenting joint which locks the head to the chamber. The segmenting concept allows large components to be fabricated separately. They are then shipped to the test area where the complete rocket is assembled.

How Hot the Moon?

An infrared detector, so sensitive that it could feel the moon cooling off during an eclipse, will be built by Hughes Aircraft Co. under a $1.8-million Navy contract. The IR detector uses a miniature refrigerating device called a closed-cycle liquid-helium cryostat. The 27-lb cryostat operates at a minimum temperature of —452°F.

A-Rocket Moves Off Boards

Nuclear-powered rockets are in the final design stages. Look for test flights within the next three years. The rockets, designed primarily for the upper stages of space missiles, could double payload capabilities. Experimental types have already been successfully ground tested. A full-scale reactor is expected in '62.

Weatherman Gets the Nod

Weather satellites are getting the go sign all over Washington. The Administration, Congress, NASA and the U. S. Weather Bureau all agree the program should be pushed. The satellites are saving the U. S. a billion dollars annually in reduced losses from bad weather. U. S. Weather Bureau officials say better weather reports and forecasts from space data have saved many lives.

Road Map for Space Men

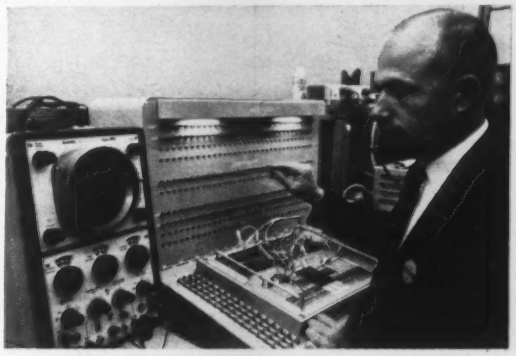
Researchers at RCA recently bounced radio beams off the planet Venus, some 30-million miles away. The object: To determine the distance from Earth to Venus within 200 miles. From this yardstick, the distances between other planets can be mapped to the same degree of accuracy. An accurate interplanetary map will be an aid to space travelers.

Metal Seals Put To Test

Hydraulic-actuator seals really take a punishment at Mach 3 speeds. A new x-shaped circular metal seal steps in to withstand wide temperature or pressure ranges. So says Lockheed Aircraft Corp. In a recent demonstration, helium was cycled against the seal from room temperature up to 800°F. A spectrometer found the leakage rate to be 1 cc every 350 years.

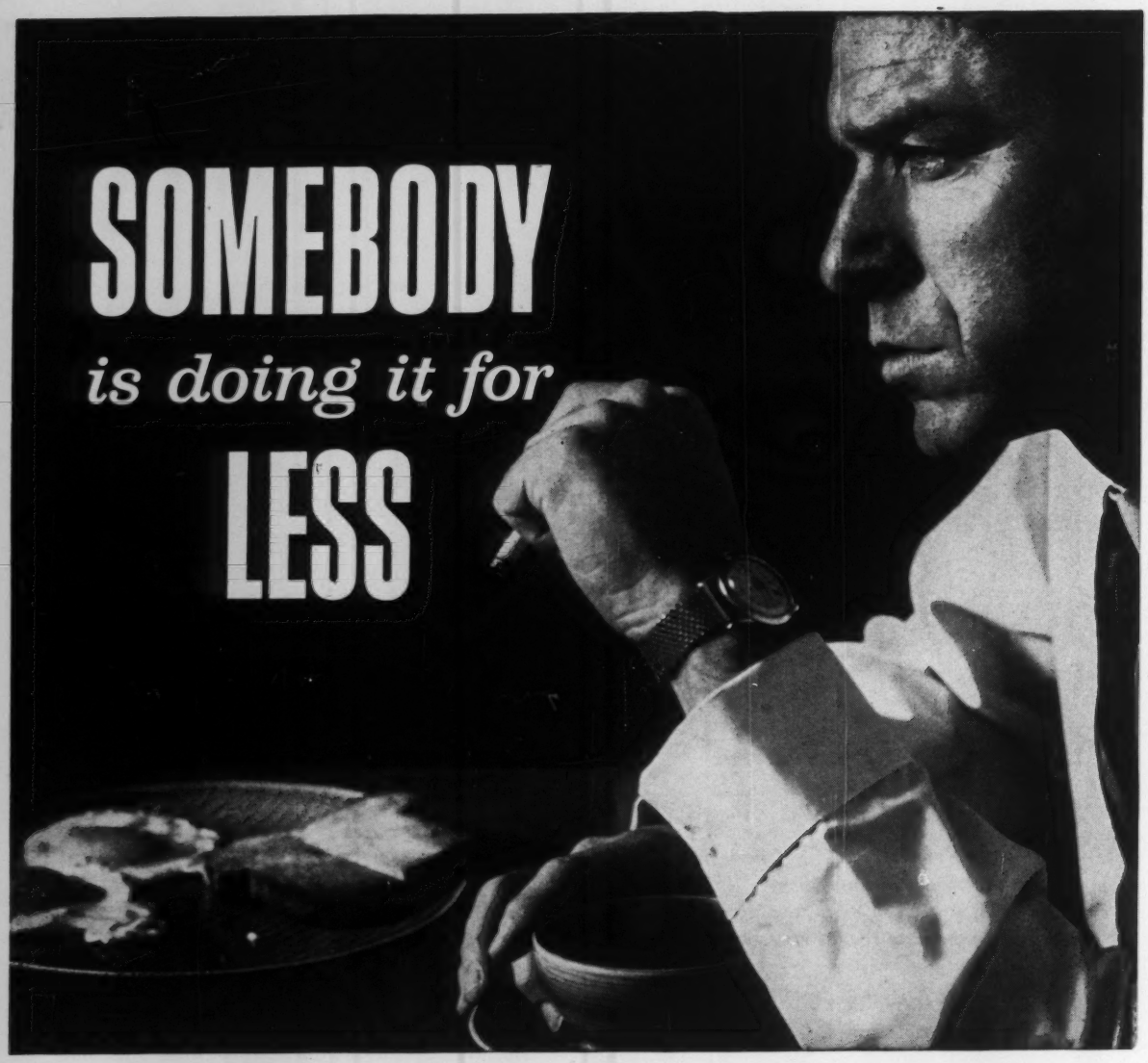
Designers Keep Plugging

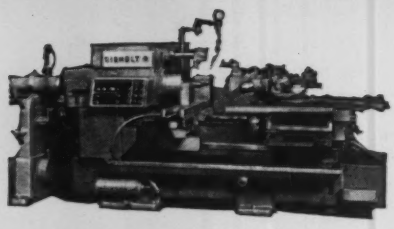
The cockpit instruments of tomorrow's space ships and aircraft are being designed by a new electronic device. Developed by North American Aviation, it uses an oscilloscope and a circuit connector which resembles a telephone switchboard. Plugging in varying connections creates images of



SWITCHBOARD: Creates instruments.

desired instruments on the oscilloscope. The device allows engineers to experiment with different instrument faces without making the actual part.





GISHOLT MASTERLINE® AR TURRET LATHE

Converts for bar or chucking work in less than one hour. Sets up like a turret lathe, uses same standard tools. Cycle setting learned in a day. Offers automatic drill withdrawal for chip clearing; internal threading with solid taps; external threading with self-opening die heads; reverse feed and individually adjustable dwell; 16 spindle speeds and infinite feeds—none lost when threading.

Ask your Gisholt Representative for a desk-side demonstration, or write for Catalog 1215.

Are you keeping step with new developments in automatic machining? Many of your competitors are —and cutting costs substantially.

Even small runs—both bar and chucking work—are now going automatic.

How? With the new, fast, easy setup designed into the Gisholt AR (Automatic Ram) Turret Lathe.

Change-over time is the same as for a hand-operated machine. And—the automatic cycle cuts machining costs 25% to 40%.

To be competitive you *must* go automatic. Why wait?

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

Turret Lathes • Automatic Lathes • Balancers • Superfinishers® • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee

Market Offensive Under Way For Tape-Controlled Tools

A marriage is taking place between the manufacturers of controls systems and the machine tool builders.

This market venture should result in heavy buying.

By **R. H. Eshelman**
Machinery Editor

■ During the past 10 years, industry has been waiting for numerical controls to revolutionize metalworking. Within that period, about 1000 to 2000 machines of this type have been installed. The bulk of these users are large aerospace companies.

But now it looks like the long-awaited revolution is ready to take place. And, with the market opening up, a battle is shaping up among the major builders of machine-tool controls: Bendix, General Electric, Thompson Ramo Wooldridge and Westinghouse.

All of these companies are clearing their decks for action. They are strong in research and development and possess excellent manpower. They also have nation-wide networks to furnish fast service.

Reverse Trend—In the earlier stages, machine-tool builders produced their own numerical controls. This is still done but the big trend is back to the actual makers of control systems.

What proof is there that these signs of optimism exist? In Detroit, one foresighted machine tool builder, Ex-Cell-O, has gone out and ordered twenty tape-control systems for on-the-shelf delivery. In June of this year, Boeing Airplane Co. placed the largest single order for contouring controls to that date.

Douglas Aircraft has just placed a similar order. Both orders include 18 highly sophisticated machines from various builders. Bendix and TRW will supply controls for all units. These moves are in harmony with the Air Force's accelerated modernization program.

MATH EXPERTS: IBM's P. H. Sterbenz (left) and S. M. Matsa check out the Autoprompt instructions required to mill a helicopter part.

Bomber Program—Boeing's equipment will replace present manufacturing setups on the $2.5-million B-52H program. Douglas will use its machines on the $3.3-million Skybolt project. Total cost of the N-C systems is near $2 million.

From the giant auto industry come guarded reports that tape controls will soon take charge of a few of the most complex and time-con-

suming tooling jobs. Targets here are machining and later even developing large body dies.

Similar signs are budding among builders of trucks and heavy-road and construction equipment. It's reported that some of these companies are well along in justification studies on tape production of short-run parts and spares.

Three Rewards — Ex-Cell-O's president, H. G. Bixby, sees three main benefits from numerically-controlled machining: Extreme accuracy, product uniformity and huge savings in time. Present-day systems, he says, provide movements in increments of 25 millionths of an inch. Before, this kind of accuracy could only be achieved very slowly by highly-skilled machinists working on toolroom machines.

Mr. Bixby also notes: "One of our customers is now engineering and manufacturing prototype three-dimensional cams in a few days instead of weeks. No business can ignore these facts and remain competitive."

Controls suppliers are optimistic about the machine tool market. A 1961 survey shows that these companies expect orders for more than 1000 positioning systems plus more than 250 contouring controls this year alone. In dollars and cents, this amounts to over $20 million.

FINAL INSPECTION: Bendix president, M. P. Ferguson, and industrial controls manager, George Knopf, inspect recent $3 million shipment.

SIMPLER INSTRUCTIONS: New controls at Thompson Ramo Wooldridge get the once-over from Dean Freed (left) and Glenn Gordon.

Looking Ahead—Typical of the vision required for the long haul is exhibited by Bendix president, M. P. Ferguson. His company supplied controls for the Kearney & Trecker milling machine now in operation at The Martin Co. This unit has been regarded as the first production setup—installed in 1957.

Mr. Ferguson points out that Bendix has built up quite a wealth of user experience through its activities in aerospace, automotive and atomic energy industries. The company has thus learned to respect the economy of numerical control for precision machines.

"There's every reason to believe," says Mr. Ferguson, "that the concept of numerical controls will be considered more and more by the auto industry and other machining industries. Productivity, lower costs, flexibility and reduced tooling expense will influence its consideration and acceptance."

Many Developments—Within the past few months there have been many announcements of "firsts" in the applications field. Included here are production gaging of both the inside and outside of contoured parts; multiple flame cutting of

shapes up to 6 in. thick; and grinding of steel mill rolls.

Other "firsts" are drafting and surface development of computer-designed airfoil shapes; bending of complex curves in aircraft tubing; and control of a circular-index machine for engine production.

From Britain, Italy and West Germany come reports that numerical controls are beginning to take hold due to shortages in skilled machinists. Simon Ramo, executive vice president of Thompson Ramo Wooldridge, sees an opportunity for U. S. controls builders to solve this economic dilemma.

Foreign Markets—According to Dr. Ramo, "We must update our present methods to keep pace with those countries which are pioneering in factory automation. For example, TRW computer systems for process control have been installed in many foreign countries. Control devices combine digital and analog techniques.

"These units," continues Dr. Ramo, "can operate a battery of complex machine tools at one time. Now that the battle against increasing operating costs and shrinking profits has reached high gear, industry will have to study the advantages of numerically-controlled machines more closely."

John Hutton, GE's general manager of specialty controls, sees future expansion for controls in the small shops where payrolls are less than 500. He also notes that computer programming with language systems will make machining of complicated parts practical for the small shops as well as the large ones.

Word Commands — Another development announced this summer is bound to pick up the tempo of acceptance in new areas. This is automatic programming. The Aerospace Industries Assn., the Air Force, MIT and many private companies have all contributed to this breakthrough. Machine commands are set up by words rather than by numbers.

The Autoprompt system, recently announced by IBM, will simplify programming even more. According to AIA spokesmen, the computer will be able to speak to the machine tool in complex rather than simple sentences. It will result in the production of more complex parts.

IBM, Remington-Rand and other computer manufacturers have been concerned about the problem of preparing numerical programs to operate the machine.

Witchcraft — Observes Glenn Gordon, industrial controls division manager of Thompson Ramo Wooldridge, "The big thing about these language developments is that they take the witchcraft out of programming. Before tape control can really come into its own, we've got to make the job of talking to the computer easy so it can be understood by a man on the shop floor."

Here is the ultimate goal of computer engineering. Give the computer a description and outline of requirements of a new part. The computer prepares a tape. From the tape, a numerically-controlled drafting machine prepares the drawing. Meanwhile, a duplicate tape produces the part. All of these elements are now in existence.

OXYGEN CUTTING: Airco's new flame-cutting machine is equipped with GE's Mark Century Controls. Punched tape now replaces templates.

Future Developments — W. M. Webster reports some of the work being carried out at the Aeronautical Systems Div., Wright-Patterson Air Force Base. Within this division's manufacturing technology lab they are working on methods whereby computer operation may be used to aid the designer.

The target is the production of a final design. Says Mr. Webster, "We hope to provide a link between the design intent and the actual data. When fed into a numerically-controlled machine tool, it will produce the designed part."

Experts at IBM feel that simplified language programming will be a great stimulant to this field. "Without the communication barrier between user and machine tool," says S. M. Matsa, one of the chief developers of Autoprompt, "it will be possible to apply numerical control to the tough jobs it's really designed to handle."

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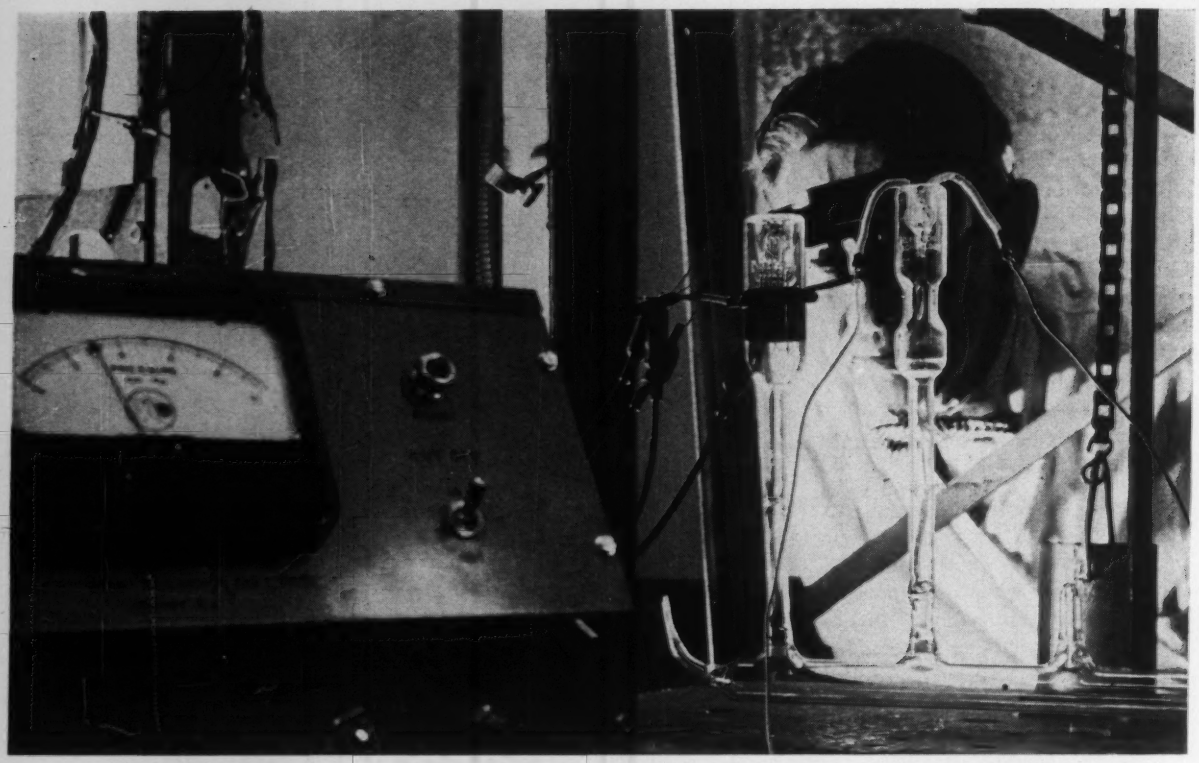


GAGE CHECK: These ionization gages contain chromallized wire and special hard glasses. Both cut costs.

Glass-To-Metal Seals Take Hold

Chromallized-Moly Wire Ups Vacuum-Tube Production

By **S. J. Koch**—President, Electron-Technology, Inc., Kearny, N. J.

Molybdenum is well suited for vacuum tubes—even though the metal oxidizes quickly.

One user gets around the problem by chromallizing the metals reactive surface.

■ One thing is constant about the electronics industry: Its constant change. Because it is a relatively young field, ideas have not had a chance to become firmly entrenched. Thus any new and better way to accomplish a goal is generally tried—often with good results.

The use of chromallized parts in making glass-to-metal seals stems from this philosophy. This new method of protecting metals from over-oxidation during glassing has proved itself.

With chromallized parts, we save time, eliminate a number of production steps, and above all, achieve seals which hold up at high temperatures.

Oxidation and Expansion—Generally, the best glass-to-metal seals are obtained by oxidizing the metal, then diffusing this oxide into the glass for a vacuum-tight bond. But two prerequisites must be met.

The metal and the glass must be closely matched in thermal coefficients of expansion. Secondly, the oxide must adhere to the base metal, and completely wet the matching glass.

Chromium oxide diffuses readily into glass, adheres strongly to its base metal, and protects against over-oxidation. Chromium - containing alloys, such as AISI 446, 430, or Sylvania No. 4 have been standard soft glass sealing metals for years.

These alloys require meticulous methods for selective oxidation of the surface chromium, and to preserve the oxide during the sealing process.

Sometimes, when the glass vessel is quite thick, the heat conducted into the glass via the metal is enough to change some chromium oxide to iron oxide. This leads to a poor bond and possible seal failure.

Builds Resistance—Most of the difficulties described above can be avoided by chromallizing the metal wire or part. This process, developed by Chromalloy Corp., West Nyack, N. Y., diffuses chromium and other elements into the substrate. This can be any carbon or alloy steel, molybdenum or tungsten. Even non-metals such as quartz and graphite can be used.

One of the most suitable metals for vacuum tubes is molybdenum. It offers an excellent seal with high-temperature glasses because of its matching expansion coefficient.

However, when sealing in air, several oxides of molybdenum are formed, none of which protects the base metal. Molybdenum oxide formed in the region of 800°C is a liquid. Thus it boils off leaving the metal exposed to continuous corrosive oxidation.

Chromallizing molybdenum ends this problem. After treatment, the surface has a case rich in chromium. This case is an integral part of the base metal and will not flake or spall.

After treating with wet hydrogen, the chromium oxide forms a very tight metal-to-glass seal. Chromallized molybdenum withstands temperatures well over 1000°C for long periods.

Shortcut Method—Chromallized-metal seals may be made in air, by conventional glass-blowing methods. Electron tubes capable of vacuum "bakeout" at 600°C or higher are readily produced without special controls.

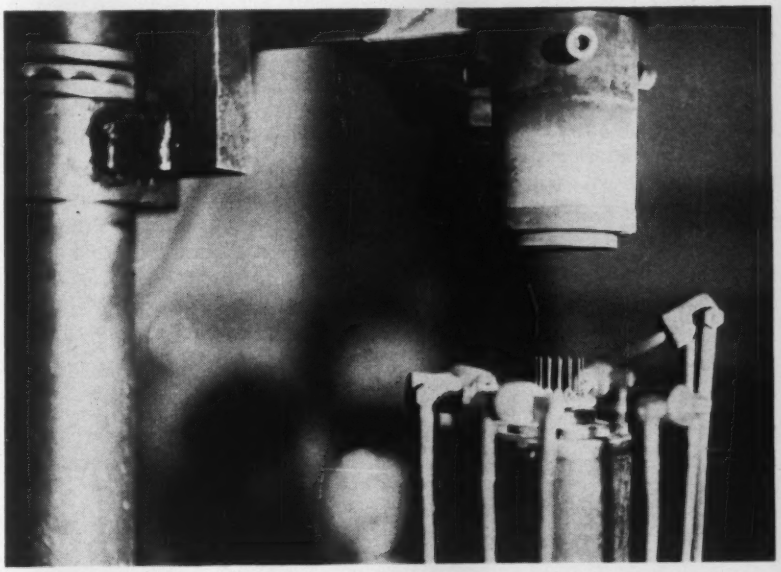
This actually means elimination of one or more production steps. For example, when the alumino-silicate glasses first made the use of molybdenum wire for button stems, carbon molds were used in a nitrogen-flushed bell jar during fusing.

Contaminants in the gas destroyed the molds causing frequent replacements. These costly replacements can now be avoided since moly wire does not require a protective atmosphere.

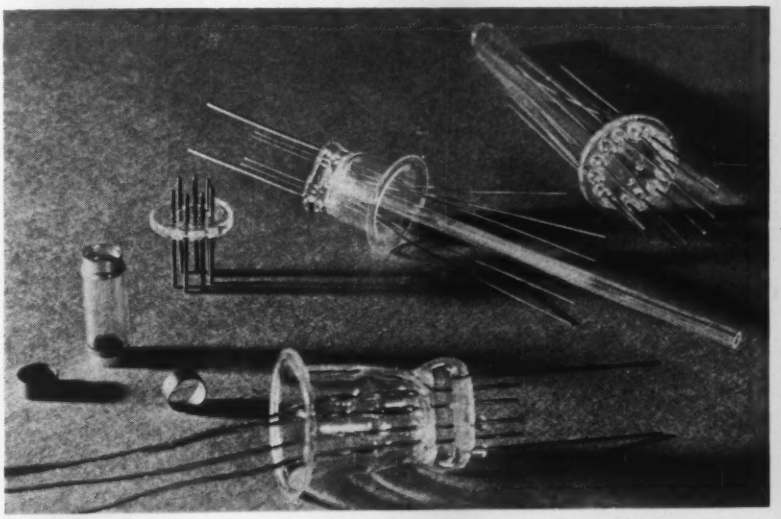
At Electron Technology, chromallized wire leads range in diameter from 0.010-0.125 in. Wires are used in tubular, solid, flat press, and dished stems of various sizes.

In addition, the company is producing a hermetically-sealed window and housing for a photo-resistor cell.

Although new, the use of chromallized seals in electron tube production holds real promise. Considering that well over nine million cathode ray TV tubes were sold last year, each with at least one anode seal, the production savings inherent in this new protective coating certainly seem to warrant further exploration.



BONDS GLASS TO METAL: To obtain a proper seal, uniform and careful heating, as well as operator skill and experience are essential.



TYPICAL PARTS: Electron tube stems depend on chromallized-moly wire or ferrules for sound glass-to-metal seals at many points.

Venturi Scrubber Wages War Against Air Pollution

Local authorities are up in arms about the reddish fumes that billow from the stacks of steelmaking furnaces.

The wet scrubber system is one good way to end the problem.

■ As the steel market grows and new mills go into operation, oxygen steelmaking is expected to become one of the key processes of the future. The introduction of the oxygen lance into the openhearth is already picking up steam.

As both of these methods continue to develop, the problem of smog control becomes more acute than ever. Management has found ways to prevent those iron-oxide fumes from escaping through the tops of furnace stacks.

Among the methods tried, however, the Venturi scrubber has yet to achieve wide industrial acceptance in this country on oxygen-lanced openhearths. This is hard to figure, too. The system, patented by the Gas Scrubber Div., Chemical Construction Corp., New York, is a popular smog-killer in American blast furnaces.

The Venturi system has been accepted enthusiastically throughout Europe, Japan and Canada. In this country only the U. S. Steel Corp.'s Edgar Thomson Works in Braddock, Pa., has a Venturi installation on a 200-ton oxygen-lanced furnace. Early results are very promising.

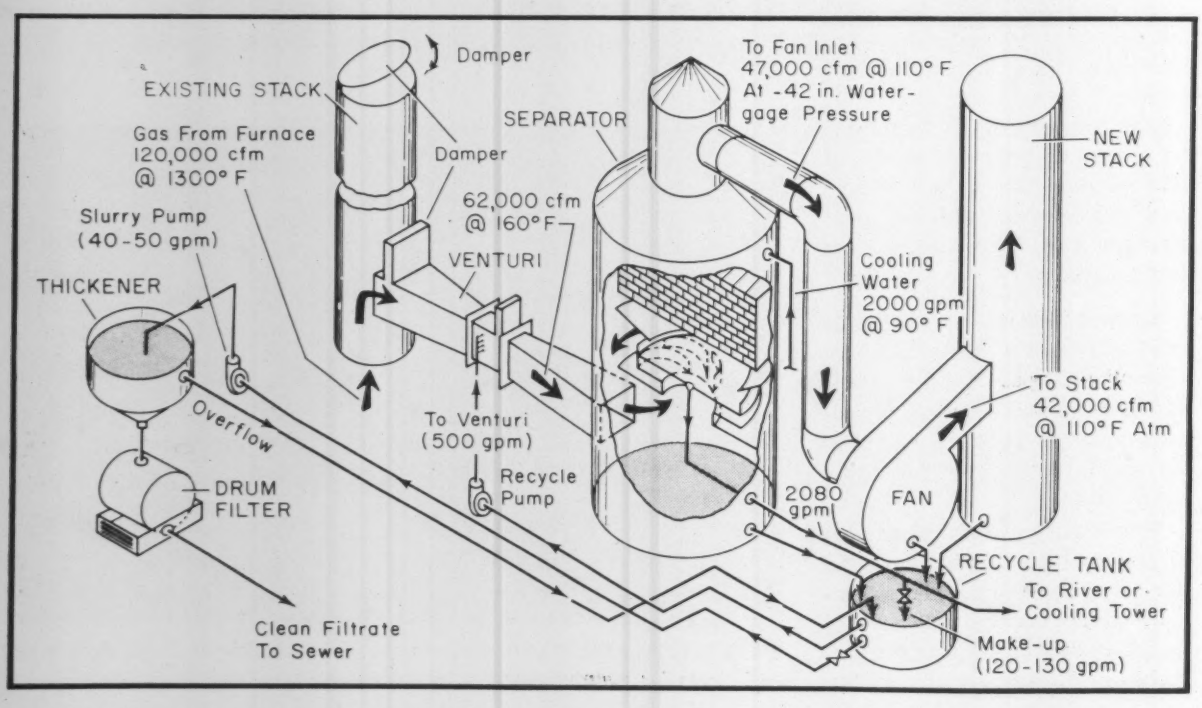
Repeat Orders—The recent purchase of another Venturi scrubber by Dominion Foundries and Steel, Ltd., Hamilton, Ont., marks the fifth such unit installed at its plant.

The local newspaper in Port Kembla, Australia, noted quite a difference in conditions due to the newly installed Venturi system at Australian Iron and Steel, Ltd. Nine seconds after the scrubber went into action the red smoke vanished into harmless clouds of steam.

Interest Is There—According to H. P. Willett, manager of the Gas Scrubber Div., it will only be a matter of time before American industry is sold on the system for openhearth use. Efficiency and economy, he states, won't be overlooked much longer.

Here are a few advantages offered

How Openhearth Stacks Get Clean Exhaust



by the wet scrubber system. The scrubber will collect iron-oxide dust wet, then recover it dry and zinc-free for re-use in the furnace. This approach eliminates the problem of handling the collected dry dust.

There's no problem with water disposal either. Since the process operates on a closed-cycle system, water consumption seldom exceeds 50-100 gpm. In most cases, maximum cleaning efficiency stands at 99.9 pct. This efficiency is constant from beginning to end, despite changes in gas flow and other variations.

Automatic Controls—A new adjustable throat on the Venturi means that the furnace draft can be controlled automatically under all conditions. At the same time, the system maintains maximum cleaning efficiency.

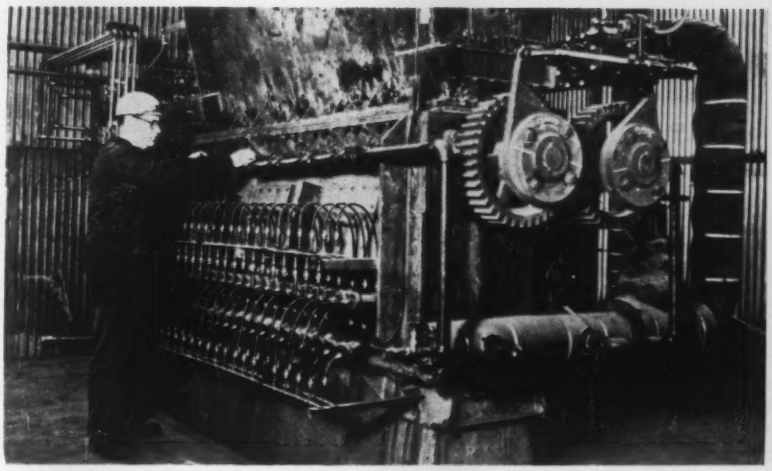
Contaminated gas is directed into the Venturi. At its throat, the gas is accelerated as it runs into a shower of scrubbing liquid. This liquid is introduced through small jets right in the throat itself.

The speed of the gas atomizes the liquid into fine droplets. Particles of dust and fumes in the gas stream are trapped by collision with the droplets of the scrubbing liquid.

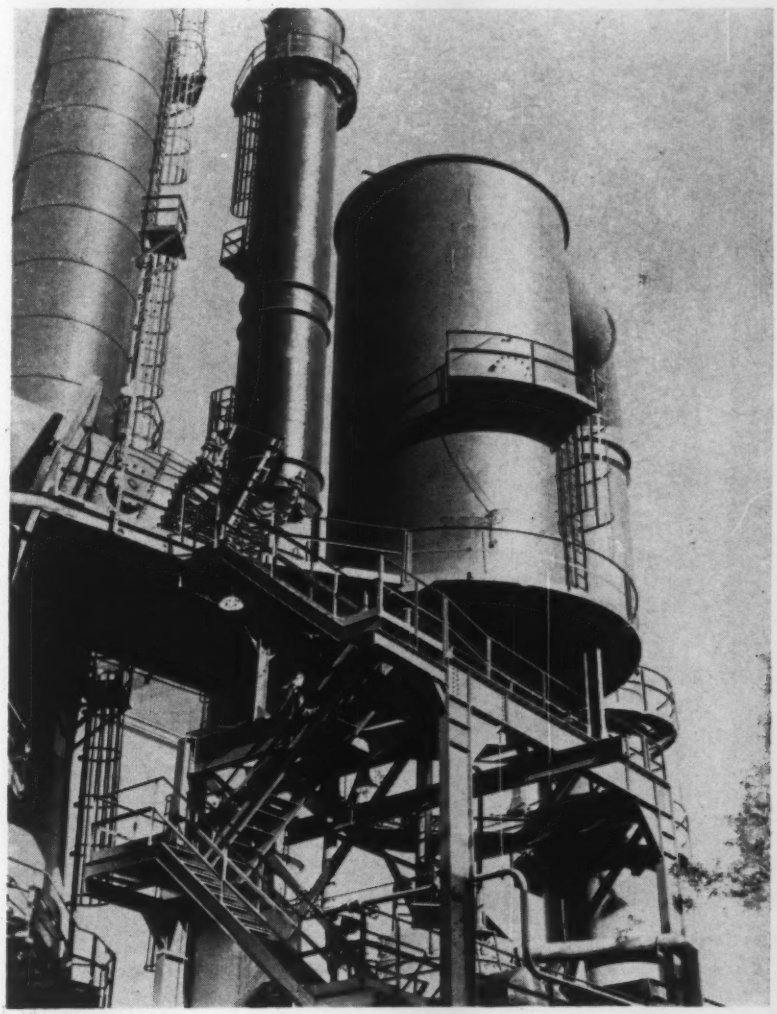
Next Step—What happens after the particles have been trapped inside the droplets? Then the agglomerates are quickly removed from the gas stream in the separator.

Scrubbed gas enters the separator, spins the liquid droplets against the wall and leaves at the upper part of the unit. Once the particle-laden liquid has drained through the bottom, it can be recycled, reclaimed or sewered.

There are those who claim that the Venturi scrubber consumes more power than other methods. But this added power cost is more than offset by low costs of operation and maintenance. For example, the system doesn't require a full-time operator. And this factor is a big savings in itself.



SCRUBBING LIQUID: Throat of the Venturi system can be varied automatically to give top efficiency for gas volumes up to 180,000 cfm.



FOR OXYGEN STEELMAKING: Clean wisps of steam emit from stacks of oxygen steel converter. They replace the deadly fumes of iron oxide.

Conveyor System Smooths Flow Of In-Process Inventory

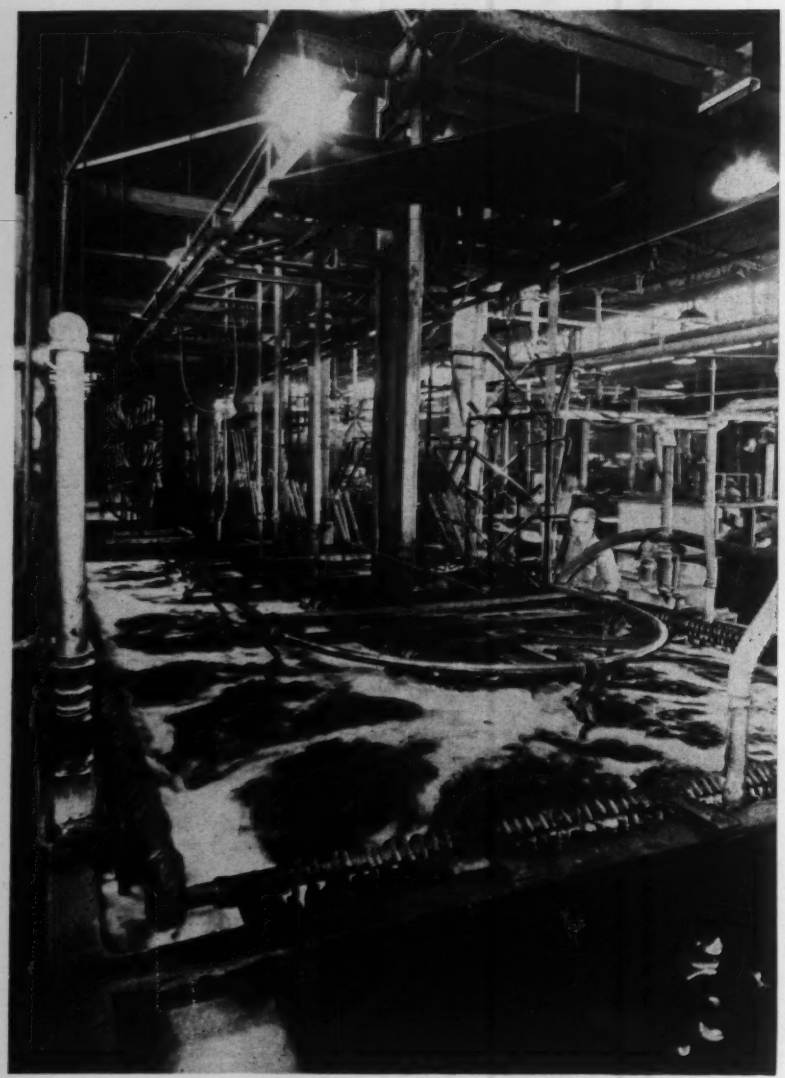
Do you have a materials-handling problem? By solving it you may reap many benefits.

One company uses integrated conveyor lines to mass produce 280 different types of parts from a "working" inventory.

■ Materials handling can be a boon or a bottleneck. Your own viewpoint probably hinges on your company's present handling facilities.

If your company makes a wide range of products, all handling operations must prove efficient at all times. Let's see how one company solved its complex materials-handling problems.

The Chromcraft Corp., St. Louis, has developed ultra-smooth handling procedures. These snag-free methods permit simultaneous mass production of 280 different varieties of products in a single plant.



PLATING DIP: A fully-automatic machine nickel-plates chair frames. These nickel-plated frames receive a minimum 0.0007-in. thick coating.

Working Inventory—An in-process inventory system feeds components right into the assembly lines. All operations are tied together with overhead conveyors. These conveyors transfer parts and materials from one working station to the next.

The conveyorized handling system yields a dual payoff. It reduces handling costs while cutting down overall inventory-investment needs.

Highly-trained employees load and unload 12 synchronized conveyor lines. For 16 hours of each day, these lines swing the various products through manufacturing stages.

Careful Scheduling — The in-process inventory system requires careful scheduling controls. Most materials enter the fabrication lines the moment they arrive at the plant. Within 72 hours, these materials wind up as a packaged end product that's ready for shipment.

A 15-man tabulating department feeds each customer order into a Remington Rand Univac 60 computer. This unit programs all production controls, order writing, inventory data and sales-analysis controls.

As the orders are processed on paper, stock enters the plant's side entrance. Not all material is used immediately. Some sheet, strip and tubular steels are received daily. These steel stocks are normally consumed within a week.

Other Supplies—Chromcraft also uses quite a bit of plywood and plas-

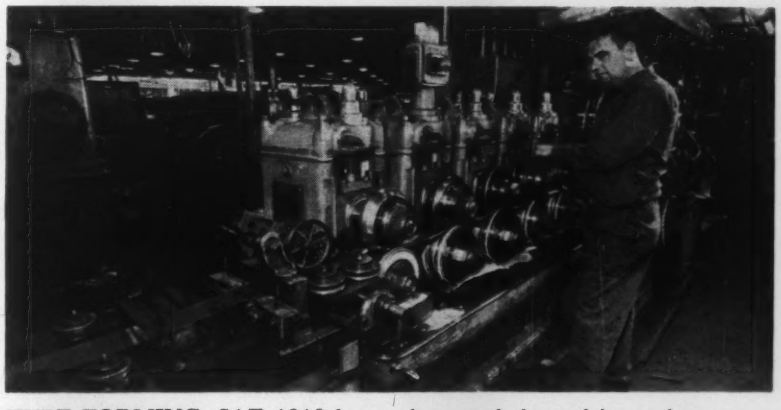
tic in making office, government and home furniture. Plywood and chip core are purchased on a 15-day supply basis. Plastic arrives daily to maintain a 30-day supply.

The company purchases as much material as possible on a cost-advantage basis. However, due to the highly-integrated production schedules, the company can't afford to deplete any supplies.

We'll check out one of the main products made in this St. Louis plant. Four primary conveyor lines turn out 3000 chairs per day. Some of these chairs have metal seats, others use a vinyl material.

Tube Mill—Tubular steel moves from the receiving or storage bays into the tube mill. This mill operates at 75 fpm. A new tube mill is being installed that will operate at 150 fpm.

The present tube mill runs a full 20 hours each day. It forms both rounds and squares, and it also cuts the tubes to length.

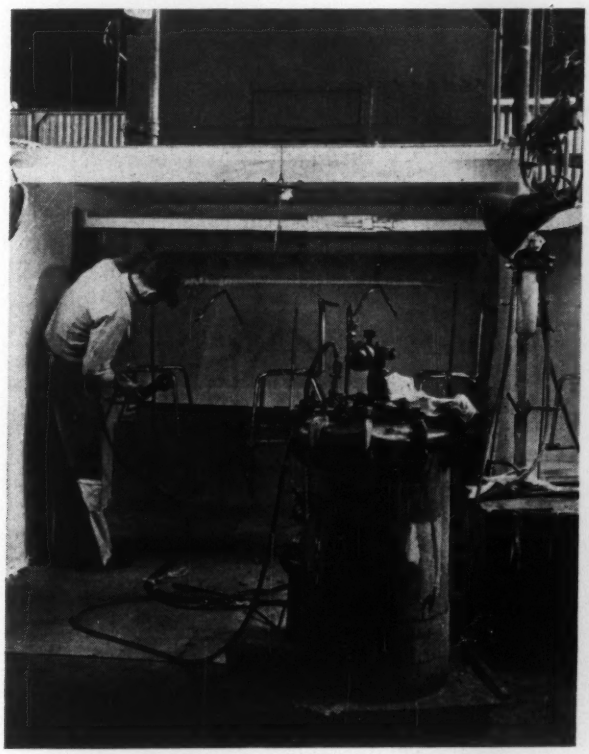


TUBE FORMING: SAE 1010 low-carbon steel, formed into tubes, serves as the table and chair legs. Argon gas is used to weld these tubes.

Seventeen hydraulically-actuated benders form two tubes simultaneously. Two centerless grinders, each with five heads, round out the tube-shaping department. These tools maintain an even production flow in this basic-fabrication area.

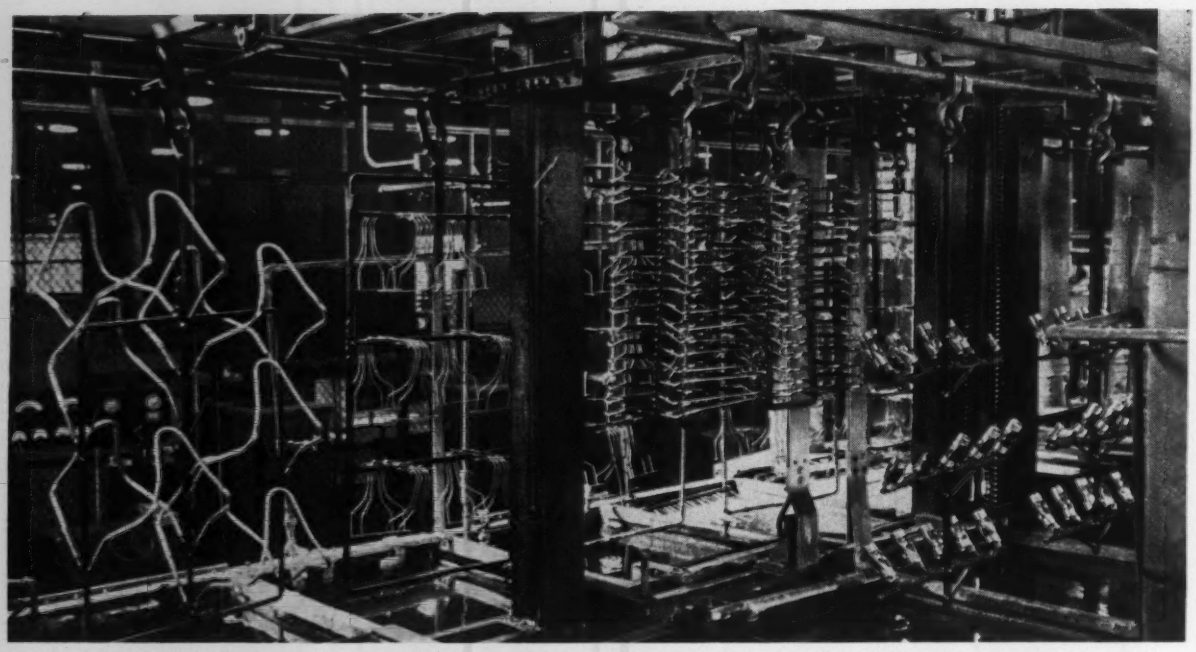
Electrostatic Painting — After shaping, the metal tubes enter another conveyor. Actually, a programmed choice is effected at this time. If the tubes are slated for painting, they swing onto one conveyor. Tubes which will be plated move along another conveyor line.

Plating details will be discussed later. At this point, we'll concentrate on painting. Electrostatic spray



HAND WORK: Operator uses a small handgun to spray complex parts. He also hand-finishes gold and clear varnish on "grain-finished" parts.

PAINTED FRAMES: Overhead conveyor carries chair frames past an automatic Ransburg paint sprayer. The chairs revolve at 13-fpm rates as they're coated.



PLATING MIX: Modern materials-handling methods allow the company to mix various production runs without affecting broad schedules. All plated parts are processed in return-type or straight-line machines.

baths apply one of five paint colors to each shaped tube.

An overhead conveyor carries each tube through one of two circular paint rooms at 13-fpm rates. The tubes revolve slowly as they receive a coating of electrically-charged paint. Each paint room sprays 100 cc of paint per minute. This paint is charged with 100,000 v of electricity.

Cut and Punch — Another conveyor, in the meantime, receives steel for metal seats. High-chrome-alloy steels are used to cut and punch all basic seat shapes.

Two other conveyors carry the seat covers and chair backs through their respective assembly stages. Of course, with all-metal chairs, it's sometimes more economical to paint or plate the chairs after assembly.

Chromcraft also turns out an average of one table per production minute. A complex fully-integrated handling system brings the multifarious table components together.

Tubular table legs follow the same materials-handling procedure as the chair legs. After the finishing process, however, braces and ferrules are added before the legs enter the final-assembly line.

Automatic Plating — Now, let's run through the plating process. Fully-automatic machines nickel-plate both table and chair legs. These machines, made by The Udylite Corp., Detroit, use bright Nickel No. 66 air-agitated solutions.

Return-type and straight-line plating machines serve in the plant. A total of 20 selenium rectifiers control up to 3000 amp from the direct-current generators.

All nickel-plated parts receive a minimum 0.0007-in. thick coating. Parts which are subsequently gold finished get a 0.001-in. thick epoxy coating. This coating is topped off by gold analine which is guaranteed not to spot out.

A 16-station Udylite fully-automatic machine handles heavier production loads. It's timed to deliver all plated components on a precise schedule. This schedule coincides with the fabrication of mating parts.

No Breakdowns — Production schedules are based on flaw-free plating operations. If one of the plating machines broke down, it would throw the entire plant off schedule. Thus, preventive maintenance and inherent quality are prime considerations.

Since the company manufactures thousands of items every day, adequate shipping and storage facilities must be maintained. There are two main storage bays. Each measures 67 x 250 x 16 ft high. A complete turnover of all stored products takes place at least once a month.

"It's our belief," states Mr. Irwin Keefer, vice president of Chromcraft, "that we've developed one of the smoothest operating materials-handling systems in the country."

He adds, ". . . we regularly process special orders on top of our normal heavy-production runs. Even with this custom-consumer production, our system never fails us."

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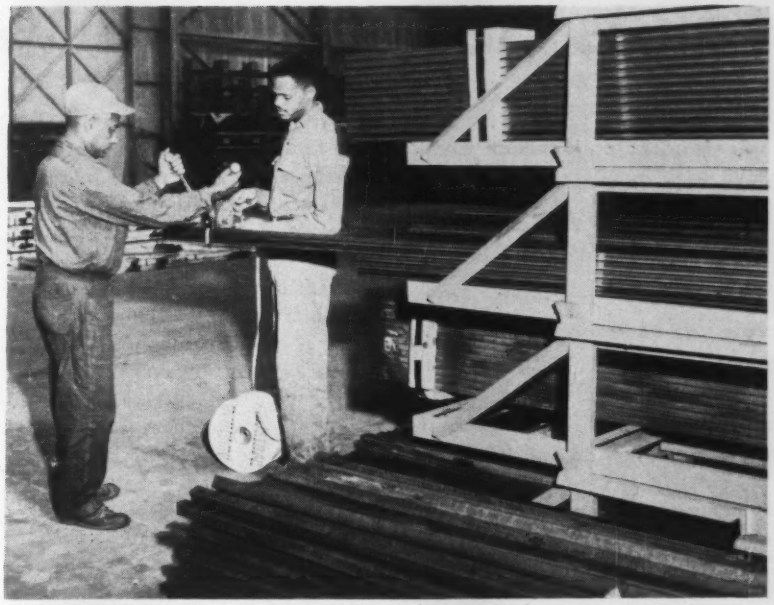
Rayon Straps Bind Soft Metals

Many men regard rayon as the exclusive province of the gals.

"Not so," say soft-metals shippers. They're using it to solve tough packaging problems.



BINDS WITHOUT SCRATCHING: Soft-metal products get a quick rayon-strapping treatment at a Glazer Steel Corp. warehouse in New Orleans.

■ The slogan for soft-metal shippers is: "Don't scratch." These distributors have to deliver scratch-free consignments. A metal product's appearance carries a lot of weight with the customer. More important, scratching or marring certain items actually impairs their performance. Cold-rolled tubing is a good example.

Although there are plenty of ways to damage a metal shipment, the packaging operation shouldn't be one of them. There's no excuse for packaging scars. Rayon strapping makes mar-free packaging a reality.

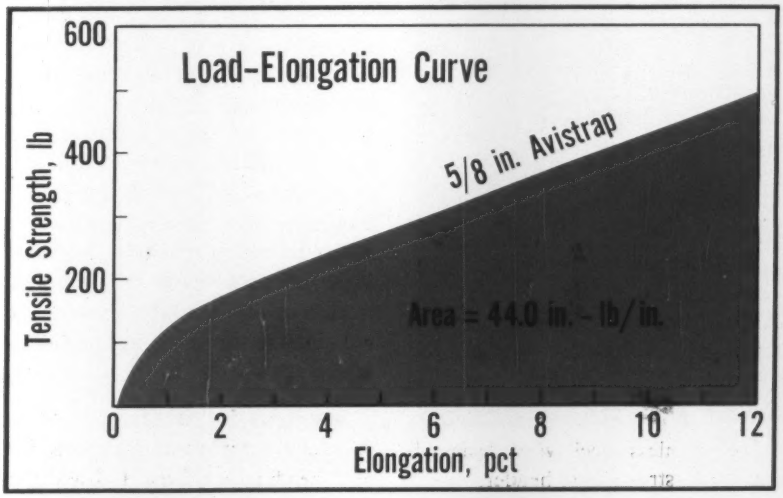
Rayon Fills the Bill—Brainchild of the American Viscose Corp., Philadelphia, this new strapping material is nicknamed "Avistrap." It offers ample strength, flexibility and a scratch-free surface for metal shipping. Let's examine a typical operation to see just how this strapping performs.

Glazer Steel Corp.'s New Orleans warehouse uses it to package 25-ft lengths of aluminum channel and angle. Six straps bind the channels. Five straps are enough for angle shipments.

Tough, but Gentle—Corner protection and reinforcement are a thing of the past. Instead, rayon straps tighten directly on the aluminum. This saves cost, time and handling effort.

Twelve-foot lengths of aluminum rod and pipe also get the Avistrap treatment. These lengths need just three rayon straps. For 20-ft lengths of light-wall tubing, five straps do the trick. Copper tubing, brass rods, and cold-rolled tubing are other Glazer products shipped with the new strapping material.

Rayon's Stretch Takes The Load



Plenty of Stretch — How can rayon strapping stand the gaff? Turning to the graph, notice that although tensile strength is not exceptional, useable elongation is quite large. A true measure of strapping performance is the energy needed to break it. This quantity corresponds to the area under the curve. Avistrap's large area indicates high impact resistance.

Of course, rayon strapping is not limited to metals shipping. It suits a wide variety of industrial jobs.

New Low-Cost Stainless Steel Takes Severe Cold Working

A stainless steel which combines cold formability and low cost would help pare inventories.

Results of year-long tests show a new general-purpose steel fits the bill.

■ A new, low-work-hardening stainless-steel alloy developed for severe cold-forming applications has been announced by Armco Steel Corp.

Named Armco 18-9 LW, the steel offers fabricating and corrosion-resistant properties similar to those of Armco 16-18 stainless and other high-nickel alloys. However, the price is equal to that of Type 305 stainless, according to Armco.

The new material is expected to be used for fasteners and related parts in automotive, aircraft, missile, chemical equipment and appliance applications where corrosion resistance is important.

Nominal Analysis

Element	Pct
C	0.10 max
Mn	2.00 max
Si	1.00 max
Cr	17.00-19.00
Ni	8.00-10.00
Cu	3.00-4.00

FEEDS INTO HEADER: Armco 18-9 LW stainless steel wire, designed for cold heading jobs, feeds into 5/16-in. triple-stroke bolt header.

General Purpose Grade — What are the reasons behind this development? "The availability of two basic stainless cold-heading grades—high-nickel stainless and Type 305—and several minor grades has created expanded inventories," explains J. P. Butterfield, manager of stainless steel products, Armco Div.

"A general-purpose grade capable of meeting both fabricating and price considerations," Mr. Butterfield says, "is expected to eliminate double inventories, and simplify ordering."

Stainless grades currently used for cold forming and heading applications include Types 430, 304, 305, and the high-nickel grades. Type 430 is effective in continuous applications and has good forming properties. For more corrosion resistance, manufacturers can use Type 304. However, this material work hardens to a high level and is not suitable for severe cold heading jobs.

Standards for Heading — Most generally accepted as standards for cold heading are Type 305 and the

high-nickel grades. Both grades have excellent corrosion resistance.

However, Type 305, says Armco, meets moderate fabricating specifications whereas the high-nickel grades, because of their low-work-hardening traits, can undergo severe cold working. Parts made from the latter retain good dimensional accuracy despite difficult specifications; die life remains good.

The table points up the low-work-hardening rate of the new Armco steel. It includes tensile strengths of stainless steels—as annealed and after varying degrees of cold reduction.

For Severe Upsetting — Results show that the rate of cold-work-hardening of Armco 18-9 LW is slower than the standard Type 305 cold-heading material, and Type 304. This low-work-hardening rate enables it to take severe cold heading or upsetting not ordinarily done with Types 304 and 305.

Armco 18-9 LW also compares favorably with the 16 Cr-18 Ni alloy, which has the lowest cold-work-hardening rate of any of the austenitic chromium-nickel alloys.

Tests show that the machining traits of 18-9 LW are very good. They approach the machinability of the free-machining grades, reports Armco. Surface finishing characteristics are excellent.

Armco test data show the corrosion resistance of the new steel to be similar to that of Armco 16-18 and Type 305 when exposed to salt spray fog, tap water, humidity tests, and marine atmospheres. In 65-pct boiling nitric acid, the material's resistance is equal to that of Type 305 and Armco 16-18.

UPSET AND SLOTTED: Variety of screws, bolts, and pins are just a few of the parts made from Armco's new, low-cost cold-forming steel.

Completes Field Testing—As part of an intensive development program, Armco 18-9 LW cold-heading wire has been used by a large mid-western fastener manufacturer for more than a year. Fastener applications, formerly needing high-nickel alloys to satisfy severe cold forming needs, were switched to 18-9 LW. Standard cold heading practices were used.

What were the results? In jobs involving upset heads five times shank diameter, shoulders, recesses, and a special #10 Phillips head drive screw with a recessed shank, the manufacturer reported 18-9 LW performed on a par with the high-nickel alloy formerly used.

In other tests involving pointing, roll threading and knurling, the new steel also performed as well as the high-nickel alloy, according to the manufacturer. Armco 18-9 LW proved superior in cut-off and slotting operations.

Armco 18-9 LW is available in the form of billets, hot- and cold-finished bars, hot-rolled rods and cold-drawn wire.

New Steel Work Hardens Slowly

Material	Tensile Strength, psi			
	Annealed	Cold Reduced, pct		
		10	30	50
Armco 18-9 LW	78,000	88,000	117,000	152,000
16 Cr-18 Ni	78,000	90,000	123,000	146,000
Type 305	78,000	95,000	135,000	170,000
Type 304	85,000	115,000	165,000	205,000

Preset Balancer Cures Rotors

Balancing odd lots of multi-sized rotors was once a problem. Each new setup took time.

Here's a unit that closes the gap. It not only spells out the proper weight to be added but also tells where and how to add it.

▪ Rotating parts can get pretty noisy if they're not symmetrical. Today however, parts seldom reach the market unless they are balanced somewhere along the line. It's such a simple job that many companies take it for granted.

But on a rotor line, where as many as 83 different types and sizes call for a little truing up, a balancing unit gets special notice. This is the case at Lincoln Electric Co., Cleveland.

Fast Check—The company uses a Gisholt Masterline 3S Balancer to check its fast production rate of parts which range in weight from 58-451 lb. The unit's extended bed allows it to quickly adjust from one lot of rotors to another. The parts get their dynamic cure at normal operating speeds.

Rotors are corrected by soldering, welding or adding washers. Sometimes, combinations of any two methods are used. This is strictly a function of the parts design. For example, if there are protrusions that can be peened over or tapped holes, washers can be added. Certain surfaces permit precut and premeasured materials to be soldered or welded.

How Unit Works—A stroboscopic lamp locates the point of unbalance. The lamp, flashing for a few millionths of a second each revolution, causes the workpiece to appear motionless.

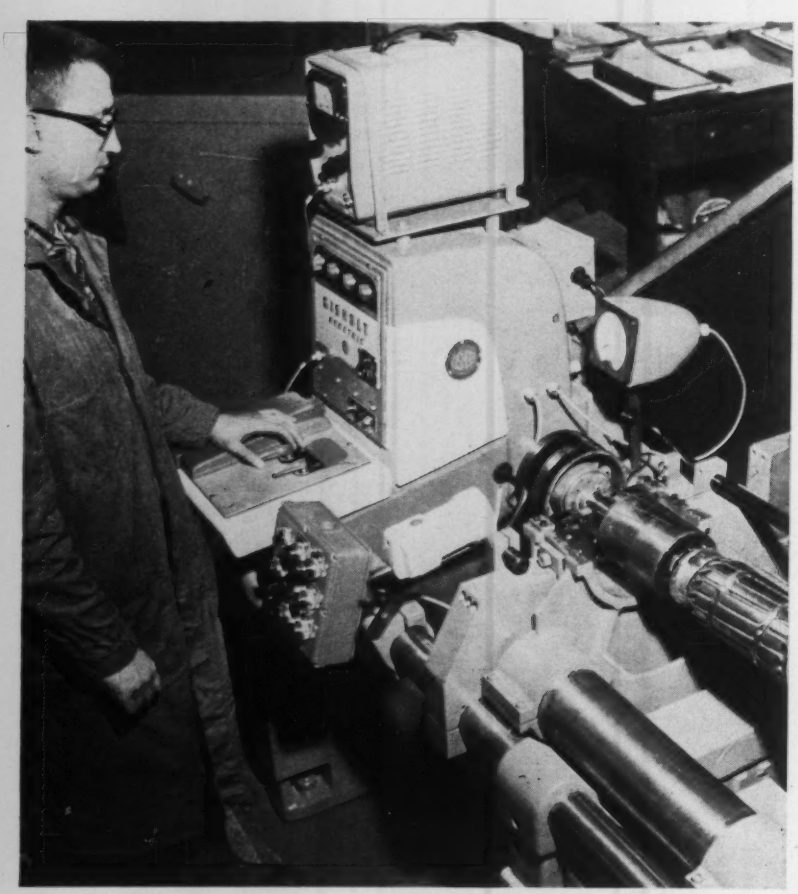
A pointer on the machine indicates a particular location on a numbered band. On the rotor setup, the band is an angularly graduated driving pulley. This angular location is the point where correction is made.

The balancer may be adjusted to show meter readings in the form of correction units to be employed. Lincoln Electric's unit is calibrated to show how much solder, or what weight of metal strip should be welded to the part. The meter will also point out which size washer to add.

Reads Two Planes—Since there are both left and right correction planes, there are separate electrical networks for each. Many times each plane requires a different correction unit. It's simple to set up one plane for weight addition, and the other for weight removal by drilling.

Idle time is kept to a minimum by a cradle fixture. It swings up to 15 in. in diameter and quickly adjusts for various lengths. Once the cradle is adjusted to the proper length, the part is fixed in a sleeve and connected to the angularly-graduated pulley.

Variable-speed drive and a tachometer permit speeds from 900-3600 rpm. Setup time is somewhat reduced by using preset speeds. Time to locate and measure unbalance in both planes ranges from 1 minute on 58-lb rotors to 1½ minutes on 451-lb parts. Correction time will vary with the method used since each rotor differs.



QUICK CURE: Time to measure unbalance in both planes ranges from 1-1½ minutes, depending on part size. Many methods insure correction.

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GUNNING	RAMMING	CASTING*
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	Korundal Ramming Mix	
	Coralite Ramming Mix Coralite Plastic Refractory	H-W Lightweight Castable 33
Castolast G	H-W Mullite Ramming Mix H-W Mullite Plastic Refractory	H-W Castolast
Apache Gun Clay	Apache Plastic Refractory	H-W High-Alumina Castable
H-W Chromepak H-W Super Gun Clay	Apachite Plastic Refractory H-W Super Plastic Fire Brick	H-W Lightweight Castable 30
H-W Harcast BF	Coral Ramming Mix H-W Black Patch	
H-W Kuplomix H-W Standard Gun Clay	H-W Standard Plastic Fire Brick	H-W Lightweight Castable 28 H-W Harcast
		H-W Super Castable
H-W Harchrome G		H-W Chrome Castable H-W Harchrome Castable H-W Lightweight Castable 26 H-W Extra Strength Castable LI
		H-W Standard Castable H-W Baffle Mix
		H-W Extra Strength Castable
		H-W Lightweight Castable Extra Strength
		H-W Low-Iron Lightweight Castable 22 H-W Lightweight Castable 22
		H-W Lightweight Castable 20
		H-W Lightweight Castable 10 H-W RC Castable

*These products may also be gunned.

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HARBISON-WALKER MONOLITHIC REFRACTORIES

Now packaged for easy handling and time saving on job site

Newly-designed square-end bags, zip-open cartons and sturdy steel drums provide users of Harbison-Walker's monolithic refractories with easy handling, better palletizing and efficient storage advantages. A distinctive color for each brand speeds product identification on the job site.

The bags for packaging castables are made of sturdy, multi-wall, moisture-proof material. Brand names and mixing directions are clearly printed on each bag. The easy-to-handle zip-open cartons contain plastic refractory slabs wrapped in polyethylene moisture-proof material, insuring good shelf life. The results—besides easy and efficient handling—substantial savings of time and labor in installation.

HARBISON-WALKER REFRACTORIES CO. AND SUBSIDIARIES *World's Most Complete Refractories Service*

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HW 61-15

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Conductive Cells

Data on industrial electrolytic-conductivity cells is contained in a new six-page offering. Tables aid in selecting the proper Teflon or Penton plastic cell for a variety of uses. Photographs and drawings illustrate diverse ways of mounting the various cells of different constants. (Leeds & Northrup Co.)

For free copy circle No. 1 on postcard

Spring-Washer Catalog

Various types of spring washers are illustrated and listed so that selection by type or size is easily made. Information on spring-washer characteristics and an exclusive, embrittlement-free, zinc-plating process is also provided. (George K. Garrett Co., Inc.)

For free copy circle No. 2 on postcard

Clean with Steam

Concise and up-to-date, a new booklet lists the most modern methods and materials currently used in steam-detergent cleaning. It offers valuable tips on steam cleaning in general, and lists six essential properties which all effective detergents should have. (Oakite Products, Inc.)

For free copy circle No. 3 on postcard

Delrin Acetal Plastic

This functionally-arranged booklet describes and illustrates design factors inherent in Delrin acetal plastic. Twenty-four pages cover strength and toughness, dimensional stability, resistance to solvents, and the fabricating and finishing of both molded and machined parts. Other topics include Delrin use in gears and bearings. (Cadillac Plastic & Chemical Co.)

For free copy circle No. 4 on postcard

Precision Reamer

Hot off the press is a new bulletin covering precision chucking, taper-pin, morse and center reamers. Also included are valuable tips on how to get top efficiency and long life from these units. (Precision Twist Drill & Machine Co.)

For free copy circle No. 5 on postcard

Flow-Sheet Symbols

This four-page reference bulletin lists the symbols used by instrument and process engineers in drawing process-flow sheets and schematic-control systems. In most respects, the symbols follow the Recommended Practice outlined by the Instrument Society of America. (Fischer & Porter Co.)

For free copy circle No. 6 on postcard

Expanding Mandrels

A complete line of expanding mandrel materials is the subject of an eight-page, two-color catalog. Two dozen uses of standard and special expanding mandrels are illustrated. (Erickson Tool Co.)

For free copy circle No. 7 on postcard

Large Line of Motors

Just off the press is a new booklet on low-speed, synchronous motors. Units in the line range from 20-10,000 hp. and from 72-450 rpm. The booklet includes an application chart which lists typical-torque requirements for normal applications. (The Ideal Electric & Mfg. Co.)

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Advice on Tapes

Entitled "How to Select a Pressure-Sensitive Tape," this helpful booklet does just that. Its two-

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FREE LITERATURE

color, four page presentation details types available, how they're made, and how to choose a particular tape for a specific use. (Johns-Manville, Dutch Brand Div.)

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Buffing and Polishing

Of value to both novice and experienced operators, a new bulletin discusses liquid and bar compounds for automatic- and manual-buffing jobs. Principal types of compounds and their applications, are covered in detail. (Hanson-VanWinkle-Munning Co.)

For free copy circle No. 10 on postcard

Floor Sealer

Applied as easily as paint, a new epoxy coating penetrates deeply and thoroughly. It reinforces flooring by forming a tough, hard surface that "wears like iron." All the details are available in a two-color data package. (The Hallemite Manufacturing Co.)

For free copy circle No. 11 on postcard

Furnace Controllers

Linear power controllers for electric furnaces are defined in a new catalog. These static devices combine magnetic-amplifier, silicon-controlled rectifiers on a single functional panel. (Norbatrol Electronics Corp.)

For free copy circle No. 12 on postcard

Magnetic Separators

Magnetic separators with ceramic permanent magnets are the subject of a new, illustrated bulletin. It stresses the advantages of this type of permanent magnet. (The Jeffrey Mfg. Co.)

For free copy circle No. 13 on postcard

Materials Handling

This large catalog contains 66 pages which cover a complete line of materials-handling equipment. On-job-photos show many of the items in actual use. For a free copy, write on company letterhead to The Vince Basnik Co., 2020 Center St., Cleveland 13, Ohio.

For free copy circle No. 14 on postcard

Heat and Ventilation

Here's a comprehensive catalog that deals with large heating and ventilating units as well as heat diffusers. Its 32 pages include easy-to-read selection charts for steam and hot-water coil capacities, fan-motor ratings, and dimensional data for all models and sizes. (Carrier Air Conditioning Co.)

For free copy circle No. 15 on postcard

Search for Information

An eight-page brochure describes American Society for Metals' new electronic system for searching technical articles, documents and patents. The system seeks out specific data on metals and related subjects.

For free copy circle No. 16 on postcard

Teflon-Cored Hose

In four pages, a new technical bulletin informs readers on bronze-wire braided hose containing an inner core of Teflon. In addition to features and uses, the bulletin includes a section on attachable, reusable fittings, plus a section on "how to order." (Atlantic Metal Hose Co., Inc.)

For free copy circle No. 17 on postcard

Transmits Temperature

Described in a colorful bulletin is an unusual, pneumatic-temperature transmitter. Design features are emphasized. These include compact construction, force-balance operation and automatic compensation for ambient-temperature and pressure changes. (The Foxboro Co.)

For free copy circle No. 18 on postcard

Steel-Marking Tools

Fourteen pages in a new catalog show the wide range of engraved-steel lettering tools available for indenting, embossing and blind stamping. The catalog includes complete specs, a removable, transparent, flexible lettering chart, and a check list for ordering. (Consolidated Stamp Mfg. Co., Inc.)

For free copy circle No. 19 on postcard

Carbide Price List

Forty-eight new catalog pages present specifications and prices on a complete line of tungsten-carbide tools, tool tips, dies and wear parts. The presentation is designed to make it easier for carbide users to find prices of standard items. (Adams Carbide Corp.)

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NEW PATENTS

Corrosion Resistance

Method of improving corrosion resistance of stainless steel, R. A. Lincoln and W. G. Renshaw (assigned to Allegheny Ludlum Steel Corp.), July 4, 1961. Coating with chromate improves corrosion resistance of stainless-steel articles. Polishing restores the original lustrous finish. U.S. 2,991,205.

Refines Iron Ore

Refining of ores with hydrocarbon gases, R. W. Hyde (assigned to Arthur D. Little, Inc.), June 27, 1961. In the direct reduction of iron ore, methane or natural gas is preheated and partially oxidized before its introduction into a fluidized bed of ore containing metallic iron. The reaction is catalyzed and the iron-oxide ore reduced at a lower temperature than when cold methane or natural gas is used. U.S. 2,990,269.

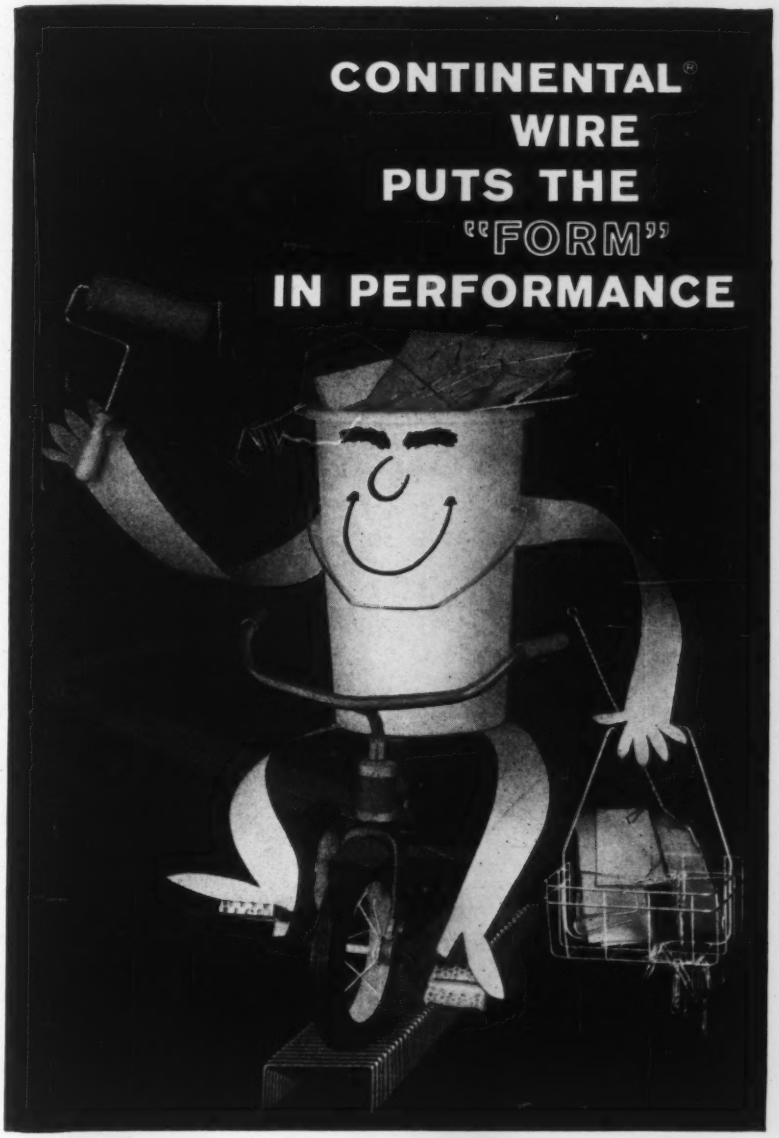
Gets Rid of Sulphur

Method and apparatus for desulphurization of ferrous metals, H. R. Spence, July 11, 1961. In the desulphurization of ferrous metals, a stream of molten caustic soda along with calcium carbide, magnesium oxide, fluorspar, or other adjuvant, is introduced into the melt. U. S. 2,992,097.

Chromium Steel

Process of producing chromium steel, C. L. McVicker and W. J. Taylor (assigned to Chromium Mining & Smelting Corp., Ltd., Sault Ste. Marie, Ont., Canada), July 4, 1961. In the production of chromium steel, the furnace is charged with chromium-bearing steel scrap and 1-5 pct carbon ferrochromium containing 1-5 pct oxygen. The components melt, and the surface of the melt is blown with oxygen until the carbon content becomes less than 0.1 pct. U. S. 2,991,174.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.



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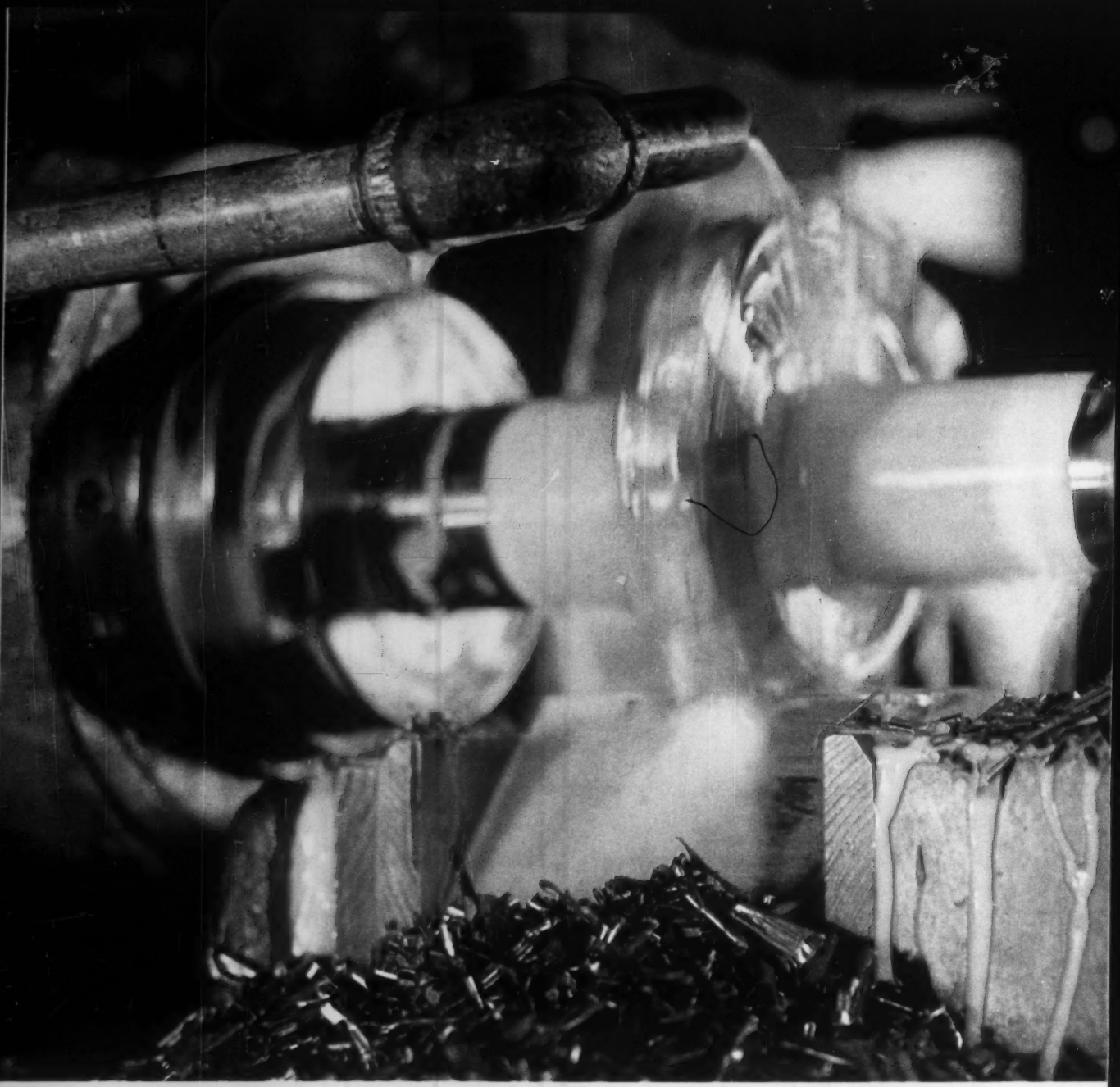


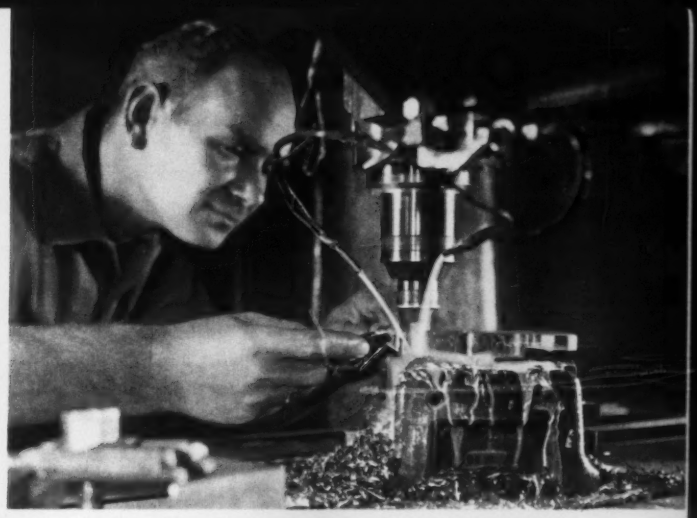
Wilson Specialty reports longer tool life, with Gulfcut® Heavy Duty Soluble Oil...

It's no easy task to machine an actuator support fitting assembly for a B-58 supersonic jet bomber. This calls for a company with a first-rate reputation in tough, complex machining jobs. The Wilson Specialty Manufacturing Company, Fort Worth, Texas, is such a company!

"Quite often, we find ourselves working with Titanium alloy and VascoJet 1000—two expensive materials," says Roy Watson, President. "And naturally, we've got to have a coolant which removes heat swiftly and gives us good tool life and a fine finish.

"Needless to say, we're fussy about cutting oils. In fact, we tried more than 8 different coolants before we settled on Gulfcut Heavy Duty Soluble Oil.

"We've found that a mixture of 20 parts water to one part oil provides effective cooling and lubricity



End milling Titanium alloy on a 3-dimensional Hydro-Version Arrow Profiler. The part is an actuator support fitting assembly for a B-58 jet bomber. The coolant is Gulfcut Heavy Duty Soluble Oil.

Roy S. Watson, right, President of Wilson Specialty, shows Frank P. Mauro, Gulf Sales Engineer, a Titanium part. Wilson Specialty tried 8 cutting oils—found Gulfcut Heavy Duty Soluble Oil to be the best!

◀ Milling groove in B-58 actuator support fitting assembly. Gulfcut Heavy Duty Soluble oil has improved tool life and increased feeds and speeds.

higher feeds and speeds
GULF MAKES THINGS RUN BETTER!

in our operations. Tools last longer. Feeds and speeds are higher. And our rejection rate is lower. Gulfcut Heavy Duty Soluble Oil deserves much of the credit."

If you're faced with a stubborn machining problem, give us the opportunity to show you how Gulf makes things run better! Call a Gulf Sales Engineer at your nearest Gulf office. Or write for Gulfcut literature.

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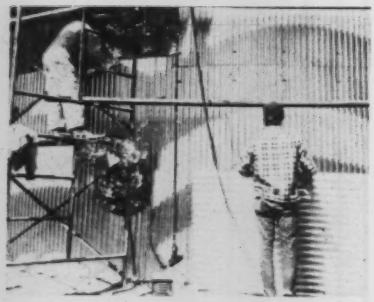
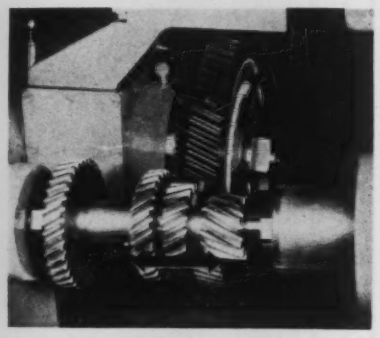
New Materials and Components



Sheet Aluminum Clads High-Grade Insulation

Where weather resistance is a must, a new insulating system offers time and labor savings. It's the happy result of a marriage between a highly-efficient insulating material and sheet-aluminum facing. Panels about 50-in. wide x 100-in. long provide a net insulation coverage of 4 x 8 ft when they're applied with the recommended overlap. The panels fasten to metal surfaces by means of threaded-metal studs that are welded to these surfaces. Studs come with the system, along with fastening nuts and washers. Panels are pre-drilled to receive the threaded studs. (Johns-Manville)

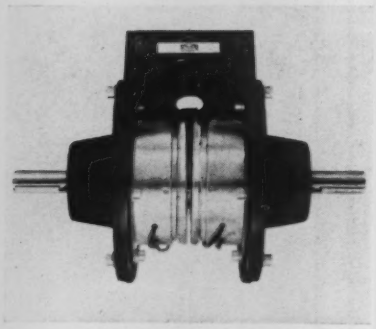
For more data circle No. 21 on postcard, p. 101



Four Motions Upgrade Abrasive Honing Action

A new approach to abrasive finishing for hardened gears and cylindrical parts embodies four-directional movement between the workpiece and the abrasive tool. The manufacturer claims it promotes better surface finishing of gears and other parts after hardening. In addition to finer finish, use of a four-motion system results in faster processing and longer tool life. The four relative movements consist of an in-mesh rotation under controlled load, a crossed-axis relationship between hone and work, a high-speed axial oscillation of the tool, and a reciprocating motion which traverses work a set amount across the hone. (Michigan Tool Co.)

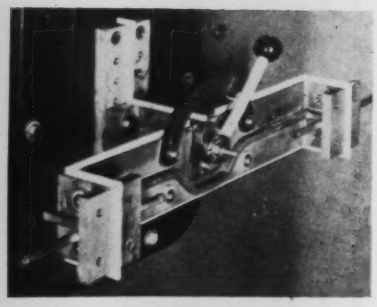
For more data circle No. 22 on postcard, p. 101



Packaged Drive Speeds Duty-Cycle Conversions

Here's a pre-aligned, clutch-brake package for fractional-horsepower, duty-cycle use. It combines an electric clutch and an electric brake in a compact unit with input and output shaft extensions. The result is an easily-installed automatic drive that simplifies machine design and speeds conversion of existing units to automatic duty cycles. There's no need to fabricate special-mounting hardware. Alignment of several different components is also eliminated. As for performance, several hundred cycles per minute are possible with the new drive. Any conventional motor can supply power. (Warner Electric Brake & Clutch Co.)

For more data circle No. 23 on postcard, p. 101



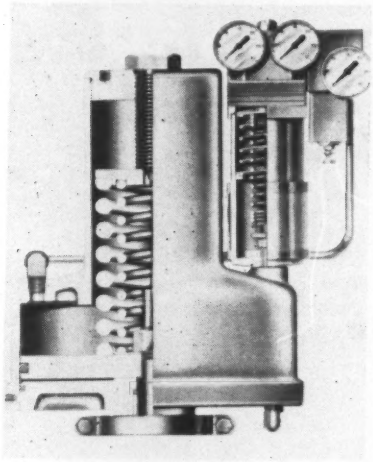
Transfer Switch Boosts Welding-Production Rate

This new switch converts a single-position welding generator for two-position operation. As a result, there's no time lost waiting for a brazing or soldering job to solidify, or for a hardening operation to quench out. Waiting time for loading is also done away with. Fixtures and work coils stay ready for use during the second phase of an operation. With most work coils there's little or no dropoff. In fact, the switch suits 100 pct duty-cycle use. The same benefits accrue when the switch is used to convert a two-position table to four position operation. (Induction Heating Corp.)

For more data circle No. 24 on postcard, p. 101

Positioning Actuator

Designed for signal pressure in the 3-15 psig range, this new positioning actuator yields an accuracy of 0.1 pct of the stroke. With air-

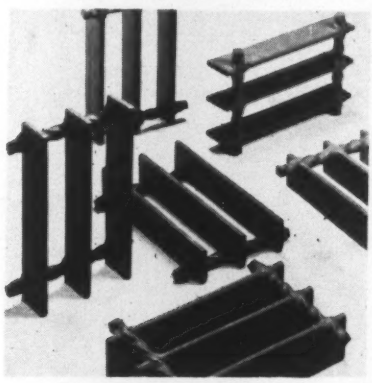


to-open action, flow through the valve body is directed in over the valve plug. In the air-to-close action, normal flow is in under the valve plug. For easy upkeep, the positioner is completely adjustable from the outside. There's no need for cut-and-try, starting-air and span adjustments that eat up valuable time. (Security Valve Co.)

For more data circle No. 25 on postcard, p. 101

Ceramic Coats Grating

Fused to steel grating at furnace temperatures of 1600°F, a new ceramic coating provides a matte-

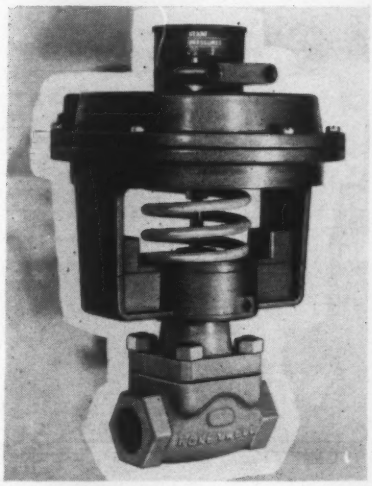


type finish for a non-skid surface. It insures a permanent, maintenance-free installation which never needs painting. In fact, weathering is said to have no effect on the surface. If mechanical damage occurs, extending into the steel core, oxidation is confined to the point of damage. There's no lateral creep. Welding or torch cutting openings in the grating causes very little serious damage to the coating. It's also resistant to most acid, alkali, and caustic exposures. (Allied Material Supply Co.)

For more data circle No. 26 on postcard, p. 101

Low-Flow Valves

New, compact valves regulate the flow of small streams of air, water, steam or chemical solutions. The line includes a low-cost, light-weight model, a high-performance diaphragm model, an ultra-low-flow unit, and two models with electric actuators. All are available in three body sizes (½, ¾, and 1 in.), with



a wide selection of reduced inner ports. (Minneapolis-Honeywell Regulator Co.)

For more data circle No. 27 on postcard, p. 101

Machining Aid

Developed to meet the need for a good cutting solution for aluminum magnesium and most of the plastics, a new formulation provides better tapping action and improved finish. Long tool life, freedom from galling and siezing, and close tolerances are other important benefits. The solution aids tapping, reaming, drilling, boring, profiling and many other precision-machining jobs. And it's safe to use on all metals and plastics without fear of oxidation, staining or erosion. It's also very economical. (The Toolman Co.)

For more data circle No. 28 on postcard, p. 101

THE FREEDOM DIMENSION

. . . means alloy flexibility

Through investment casting, your metal parts can be made in a wide range of ferrous, nonferrous and super alloys. Results — better performance...longer life...lower costs!

This part for can making machinery now cast in a non-machinable alloy offers a very high degree of resistance to wear and corrosion. Results — costly parts replacement problems ended.

Better alloys often cost no more than the "inexpensive" ones when your part is an investment casting. What counts is *castability,* not machinability.

Write for complete technical and facilities information.

HITCHINER

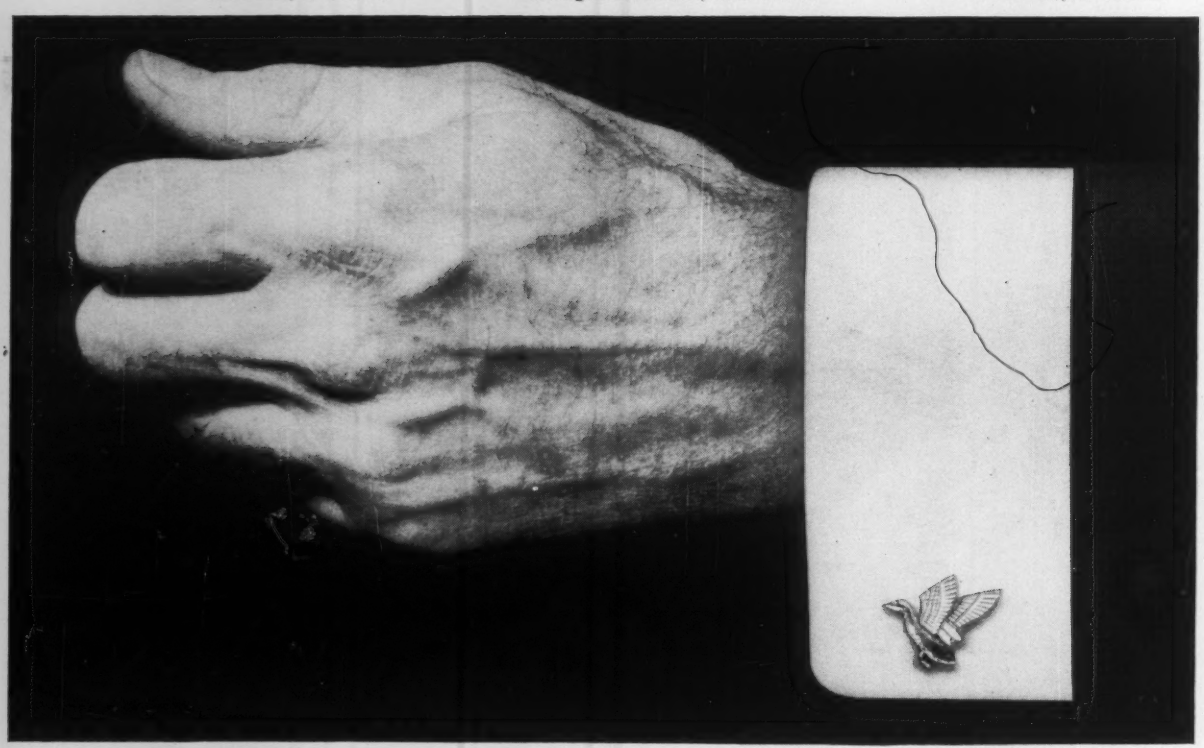
Milford 2, New Hampshire

vapor degreasing in Columbia-Southern Trichlor helps SWANK INC. set the quality pace, save on finishing costs

Natural topaz cuff link

Monogrammed tie clip and cuff link

Hand carved jade cuff link



Gleam of quality and appeal of unusual design characterize this selection of men's accessories from the Swank collection. Recent additions to the line include a full selection of small gift items and watches for men and women.

Attleboro, Massachusetts—Craftsmanship is a tradition in this New England jewelry center where Swank, Inc. produces its world-famous line of personal jewelry for men. Top quality in every price range demands care in manufacturing methods backed up with smart cost-control to keep them competitive. That's why vapor degreasing with such solvents as Columbia-Southern TRICHLOR was a natural to help Swank management meet the dual needs of effective cleaning at low cost.

Thousands of tiny parts made of all the decorative metals from brass and bronze to gold, silver, rhodium and others are buffed to a quality glow before final processing or protective plating. Since finish bespeaks quality in jewelry, no blemish-causing bits of soil could remain after the final cleaning step. The variety of metals to be processed, the tenacious buffing compounds to be removed without affecting the surface and the need for economy, gave the production department a real challenge.

Vapor degreasing was Swank's answer to the challenge. Taking advantage of modern equipment and the dependable quality of supplies like Columbia-Southern Trichlor with its heavy duty neutral stabilizing system, they were able to set up an efficient rate of continuous production without expensive shut down. Swank buys its Trichlor through Kraus Distributing Company of Providence, who also supplies other finishing materials.

A typical example of problem-solving teamwork between distributor and technical service from PPG's Chemical Division occurred recently which points up the value of well-informed suppliers. Swank was experiencing a mysterious build-up on the filters and distillation equipment which prevented proper operation of their large degreasing machine. A hurry-up call for help brought the distributor and the PPG representative. Sticking with the job until solved, they came up with the reason—an extra heavy load of insoluble spinning compound on parts being cleaned—and the solution, which involved adjusting the through-put rate and the method of work handling. Result: a return to production in a short time, with resultant savings.

Swank has found that Columbia-Southern Trichlor meets every test of quality and performance as a low-cost cleaning solvent in vapor degreasing. Trichlor is tailor-made for today's high production rates. It is produced under "Triple-check" quality control during manufacture for purity, uniformity and stability. This super-stabilized system helps protect your equipment from acid build-up. Finally, it is sold nationwide, through experienced distributors and backed up by qualified PPG Chemical Division technical service engineers. No wonder leaders like Swank of Attleboro look to Columbia-Southern Trichlor to keep them on target in efficiency and low cost.

For more details on vapor degreasing—the modern answer to metal cleaning—call your Trichlor distributor or our district office nearest you.

columbia | southern chemicals

CHEMICAL DIVISION

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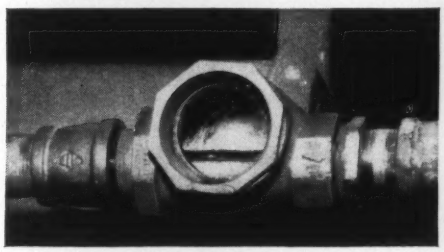
DISTRICT OFFICES: Boston · Charlotte · Chicago · Cincinnati · Cleveland Dallas · Houston · Minneapolis · New Orleans · New York · Philadelphia Pittsburgh · San Francisco · St. Louis · IN CANADA: Standard Chemical Limited

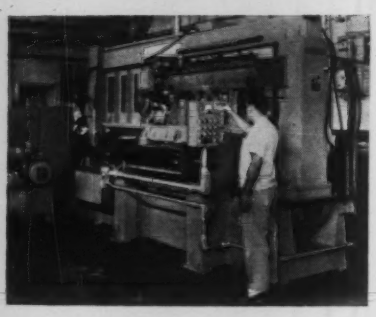
Bill Lovenbury of Swank and Martin Kraus of Kraus Distributing Company, Trichlor distributors, inspect a rack of belt buckles which are clean, dry and ready for final plating. Swank designed many of its own work-handling racks and baskets to insure complete exposure to solvent.



Clear Trichlor flows past the sight glass after distillation, ready for more cleaning mileage. Swank has improved costs with many ingenious modifications of equipment, and increased awareness of solvent use by metering the solvent supplied to every department.

Mechanized vapor degreasing machine charged with Trichlor meets Swank's need for high production and economy. Combination of liquid spray and vapor rinse gives superior results in short time. Return conveyor system simplifies handling (one man loads and unloads) and reduces solvent loss.

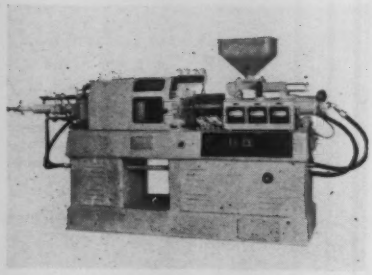
New Equipment and Machinery



Automatic Coil Joiners Yield High-Strength Joint

This new automatic coil joiner butt-welds galvanized-steel strips by the carbon-dioxide arc method. It also shears strip ends and grinds weld buildup for a flat, burr-free joint. This is done in an automatic sequence that develops as the strip passes at right angles through an "O"-frame roller on the machine bed. Welding torch and high-speed grinder mount together on a track at one end of the frame. Travel of both is controlled by an independent, variable-speed drive. Clamping, shearing and welding occur on the forward stroke. (National Electric Welding Machines Co.)

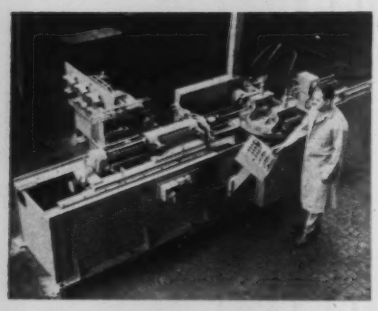
For more data circle No. 29 on postcard, p. 101



Plastic-Molding Machines Adapt to Specific Jobs

New, plastic-injection molding machines feature the "building block" concept. Thus, you can select many different combinations of long-stroke, adjustable, toggle clamps and injection units. As a result, the new machines can be tailored to suit any specific application. Also of interest is the printed-circuit electrical system. It features plug-in relays, limit switches and timers. These plug-in units can be replaced in seconds. All electrical circuits are wired at the factory. (Moslo Machinery Co.)

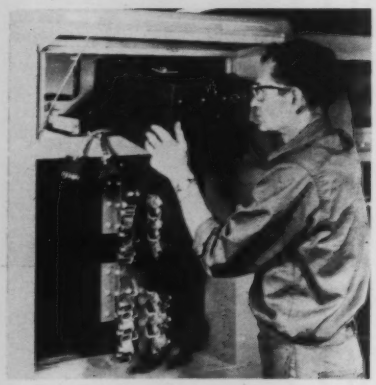
For more data circle No. 30 on postcard, p. 101



Microhoning Machines Stack the Work Horizontally

Wrist-pin bores in eight connecting rods get a simultaneous honing finish on a new machine that stacks the rods. The honer removes an average of 0.0025 in. of stock to generate the 0.926-in. diam x 1.032-in. long bore. Tolerance of the diameter is held to 0.0003 in.; straightness and roundness to 0.0002 in. Gross production equals 640 parts per hour. Parts are stacked horizontally and honed as though they were one long part. Advantages of this method include simplicity (since only one spindle is used) and great abrasive economy. (Micromatic Hone Corp.)

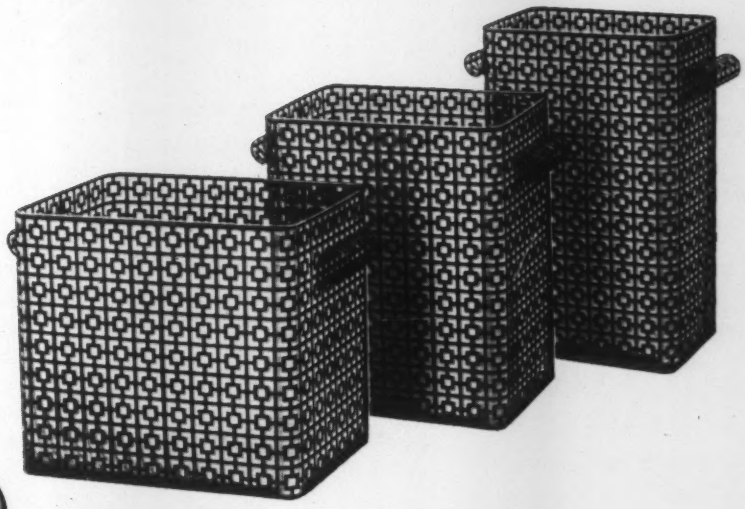
For more data circle No. 31 on postcard, p. 101

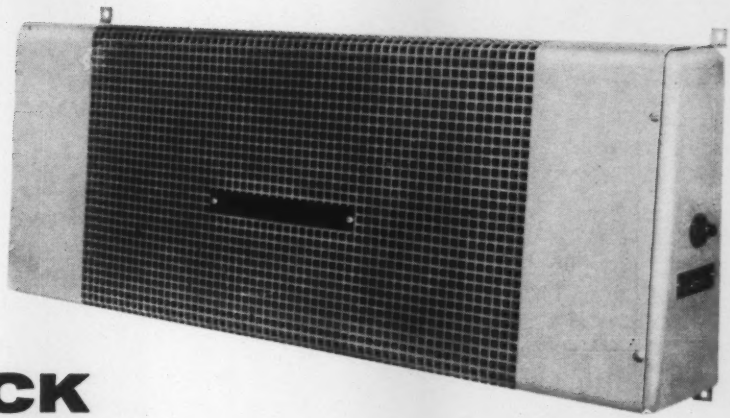


World's Fastest Electrolytic-Grinding Machine

According to the manufacturer, this new electrolytic machining machine holds the title of "World's Fastest" by a comfortable margin. It packs enough punch to dissolve a record 60 cu in. of metal per hour on electrolytic cavity sinking or grinding jobs. A full 10,000 amp of current can be concentrated in a working area of less than 3½ sq in. The result is a penetration rate as high as 0.3 ipm. This triples the previous high. The new machine's power supply comes with an accurate voltage controller, key item for precise metal removal. This component automatically monitors and adjusts the cutting voltage to maintain top removal speed without sparking. At the same time, it filters out unwanted voltage fluctuations, that prevent smooth finishes. (Anocut Engineering Co.)

For more data circle No. 32 on postcard, p. 101





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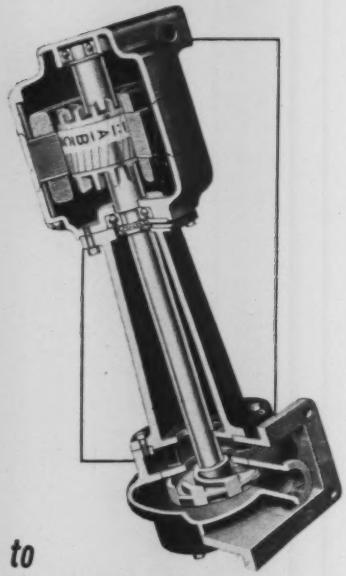

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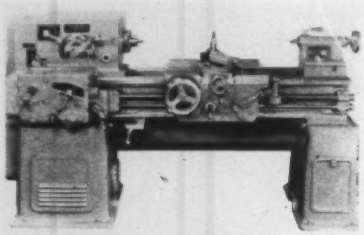
NEW EQUIPMENT

Medium-Duty Lathes

New geared-headstock lathes feature friction clutches and brakes which provide spindle control while the motor's running. In addition, extra-heavy gearing in the headstock means maximum power at the spindle. Two shifter handles pro-

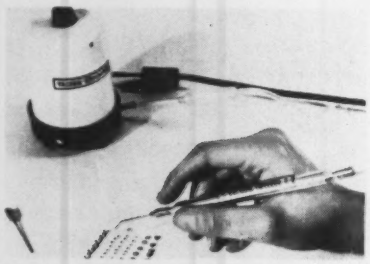


mote quick-and-easy, spindle-speed changes. Power is applied through a triple vee-belt pulley on the drive shaft. Because of these features, the lathe handles rugged turning operations not normally possible on a medium-duty lathe. Through the various controls, speeds from 20-900 rpm can be obtained. (The Carroll-Jamieson Machine Tool Co.)

For more data circle No. 33 on postcard, p. 101

Handles Tiny Parts

Vacuum energy facilitates quick and safe handling of tiny objects and delicate parts in a new self-contained system. Operation is extremely simple. On the pencil-

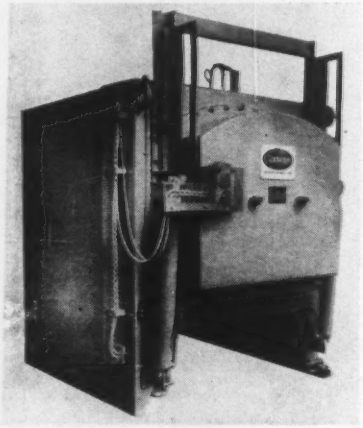


shaped body of the lifter, there's a small bypass opening. When the operator wants to pick up a part, he simply places his index finger over this opening. The vacuum is then exerted at the pick-up needle. The aluminum lifter body connects to a vacuum generator via rubber tubing. Stainless steel pick-up needles of various sizes are included with each system. This equipment lets the operator pick up, hold, sort, carry or deposit miniature parts without causing damage or defects. (ANCO Products)

For more data circle No. 34 on postcard, p. 101

Box-Type Furnace

This electrically-heated furnace can be used with or without a protective atmosphere for hardening, annealing, normalizing and preheating. Since air operates the foot pedal, the furnace operator has both hands free for loading. Heating elements are located in the furnace door, side walls and below the hearth for even heat distribution. A flame curtain automatically ignites when the door is open. This protects the furnace atmosphere. The fur-



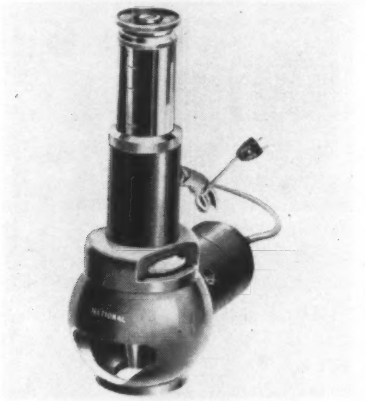
nace comes in 21 sizes with heating-chamber dimensions ranging from 5 x 8 x 18 in. to 30 x 48 x 96 in. Top operating temperature is 1950°F. (Sunbeam Equipment Corp.)

For more data circle No. 35 on postcard, p. 101

Portable Microscope

A pocket-sized, portable, measuring instrument promotes on-the-spot inspection in the laboratory, in the shop or in the field. The instrument features zoom-type magnification, continuously variable from 27X to 40X, 55X to 80X or 82X to 120X. Its measuring scales read directly to 0.002 in., 0.001 in., 0.0005 in., 0.02 mm, 0.01 mm or 0.005 mm. Magnification range and desired measuring scale can be selected by merely interchanging

eyepieces. Self-illumination is also provided with both an integral flashlight illuminator and a transformer

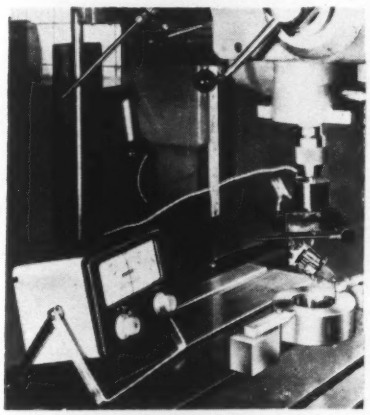


that plugs into the 110-v ac line. A high eye relief of 1 in. permits use while wearing glasses. (National Instrument Co.)

For more data circle No. 36 on postcard, p. 101

Finds the Center

Here's an accurate electronic-measuring instrument that centers holes or cylindrical forms under various types of machine spindles. Several magnifications are available: The highest being 5500:1, with 0.000020-in. graduations. Other uses for the unit are checking spindle runout and exploring for taper, bellmouth, squareness, roundness and concentricity. In operation, a rotary connector allows the gage head to rotate freely with the

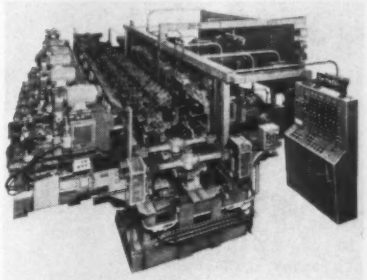


spindle, while the amplifier remains stationary. Amplifier and gage head can also be used separately. (Federal Products Corp.)

For more data circle No. 37 on postcard, p. 101

Nine-Station Line

Here's another good example of the building-block concept in machine tools. It's a nine-station transfer machine that processes rear-axle housing assemblies in multiples of two. In the process, the machine gages, turns, chamfers, faces, rough bores, reams and drills flange holes in the assemblies. It processes two housings at the same time, with a production rate of 200 per hour. Cycle time is a scant 36 seconds. The complete line is assembled en-



tirely from building-block machine components. (Lasalle Machine Tool, Inc.)

For more data circle No. 38 on postcard, p. 101

Vibratory Screen

Design of these new, horizontal, vibratory screens cuts out all dead weight counter-balances. The reason is balanced-mass design which insures that all screening or conveying decks are balanced one against the other. Another advanced feature is center-point suspension. Thus, the screen decks are supported on the base exactly at their center of oscillation. The result is that no vibration is transmitted to the base frame. Dampeners aren't needed; nor are any special supporting structures required. In addition, the screen's positive drive provides a linear oscillation that conveys materials uniformly across the screen without sliding. Since screen decks oscillate against each other, their natural rhythm alternately stores and releases energy. Once this motion starts practically no additional power is required from the motor. (COMCO Corp.)

For more data circle No. 39 on postcard, p. 101

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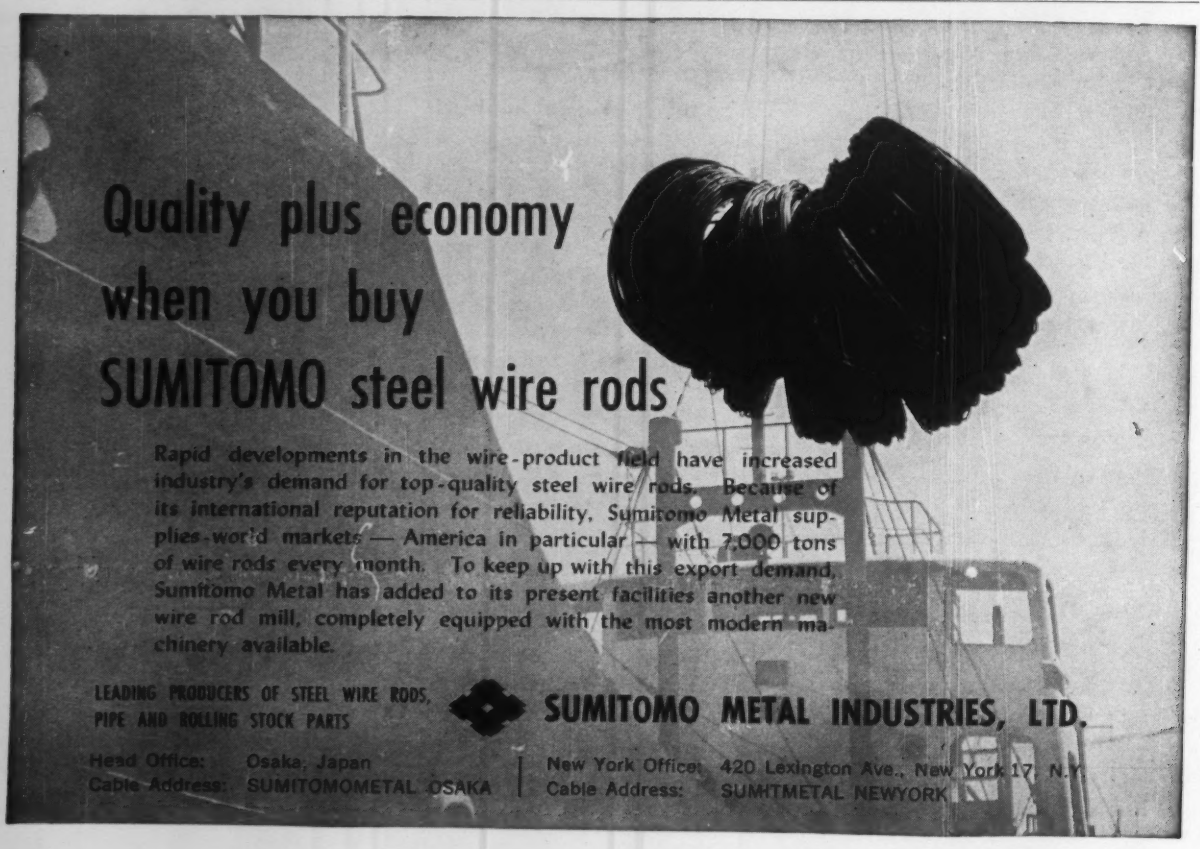

Rapid developments in the wire-product field have increased industry's demand for top-quality steel wire rods. Because of its international reputation for reliability, Sumitomo Metal supplies world markets — America in particular — with 7,000 tons of wire rods every month. To keep up with this export demand, Sumitomo Metal has added to its present facilities another new wire rod mill, completely equipped with the most modern machinery available.

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Price Increases Under Attack

Although there is no decision on steel price increases, the industry is under attack from Washington.

In the general steel market, demand continues to advance on a broad base. Automakers are still placing orders with caution.

■ Administration and Democratic Congressional pressure is building up to halt any moves to increase steel prices.

This is reflected in last week's massive attack against steel price increases by the Senate's most powerful group, representing a majority of Senate votes. It is backed up by behind-the-scenes moves by Administration people up to the Cabinet level.

Phantom Prices—But these two facts stand out:

Increases in steel prices are still "phantom increases." No decision has been reached in the steel industry on what, if any, price moves will be made after the Oct. 1 steel wage increase.

But industry leaders are determined not to be intimidated by threats or pressure from Washington. The final price action will be determined by market forces. These include competition, from other materials and from imported steel, and overall demand.

Increases Possible—Without any final decision reached, there is still a chance of selective price increases.

These would not be across-the-board, but would apply to products in strongest demand and products where present prices are out of line with costs.

It is unlikely that selective increases will approach $5 per ton. Instead, they could range from $2.50 to $3.50 per ton, if they come.

If prices are raised, the Administration will make every attempt to "roll back" the increases through "persuasion."

Upturn Gains Momentum — On the overall market picture, the forces of a major upturn are still gaining strength. This is reflected in a late August surge of orders, a lengthening of lead times in some areas, and a stronger overall demand.

As a result of the recent upturn in orders, August is likely to be the best month for shipments so far in 1961. This is an indication of the speed with which the market can change under present conditions. Early this month there was an undertone of pessimism.

Automotive Hesitation — Orders started to pick up a little over two weeks ago, with some mills getting the lift even more recently. The gain has been a broad one, with emphasis on products tied in with construction. Galvanized and tinplate remain strong.

Although August and September are looking like good months, a lot hinges on the auto picture. Although auto steel orders are coming in, volume is not great enough to strain capacity. The labor situation should be clarified this week. Until contracts between the Big Three and the United Auto Workers are signed, automakers are placing their steel orders cautiously.

District Steel Production Indexes 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	116	114	99	88
Buffalo	93	90	79	85
Pittsburgh	97	90	88	68
Youngstown	96	96	87	77
Cleveland	119	109	99	83
Detroit	134	128	96	109
Chicago	109	106	105	87
Cincinnati	114	109	116	86
St. Louis	125	115	110	89
Southern	111	110	105	90
Western	117	115	112	83
U. S. Index	108.4	104.4	97.6	83.0

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	2,020	1,944	60,110	72,302
Ingot Index				
(1957-59=100)	108.4	104.4	94.9	114.1
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$38.50	$37.83	$37.17	$32.50
No. 2 bundles	$25.17	$24.50	$24.17	$22.83

Worth Watching: New LCL Plan

Railroads have generally given up on LCL shipments. But one company—Soo Line—is out to prove this can be a profitable venture.

If Soo succeeds, it may cause a reassessment on the part of many shippers. PA's will find it worth watching, too.

■ U. S. railroaders and shippers have something new to watch closely. It's the Soo Line railroad's opening battle to recover Less Carload Lot (LCL) traffic.

Though freight tonnages hauled by the nation's railroads have gained along with a growing economy, LCL shipments have slipped steadily. But now, Soo Line is implementing a program to recover the traffic lost to truckers over the past decade. It's the most radical switch since railroads tried piggy-back.

If the plan succeeds, it may cause a reassessment on the part of many shippers. It will boil down to direct LCL competition between trucks and trains.

The Gains—T. R. Klingel, Soo's operations vice president, told The IRON AGE: "We see a 30 pct gain in our LCL operations through July, 1962. In fiscal year 1963, if things work out, I think we can outdo that 30 pct gain."

When a new management team assumed command of Soo in January, it called in Middle West Service Co. Purpose: An examination of the weak sides of the total profit picture and an evaluation of LCL as a potential profit-maker.

Middle West's George Frank pointed out that real growth potential is in LCL traffic. For example, general freight is gaining at an annual rate of 3.5 to 4 pct. But LCL has a growth rate now of 8 to 10 pct each year. And, until now, trucking has been making the inroads.

What is LCL business? It includes everything that moves by truck—much of it to small towns. Paper, furniture, drugs, auto parts, machinery, farm equipment, machine tools, and even household goods are fair game for the LCL seller.

The Reason—Research showed that pickup and delivery is the major problem facing railroads. Soo now plans to reshuffle its contract truckers to keep those offering the best delivery. It will also probably get into some P&D trucking of its own.

At the same time, Soo will inaugurate a cost-cutting program in its own end of P&D.

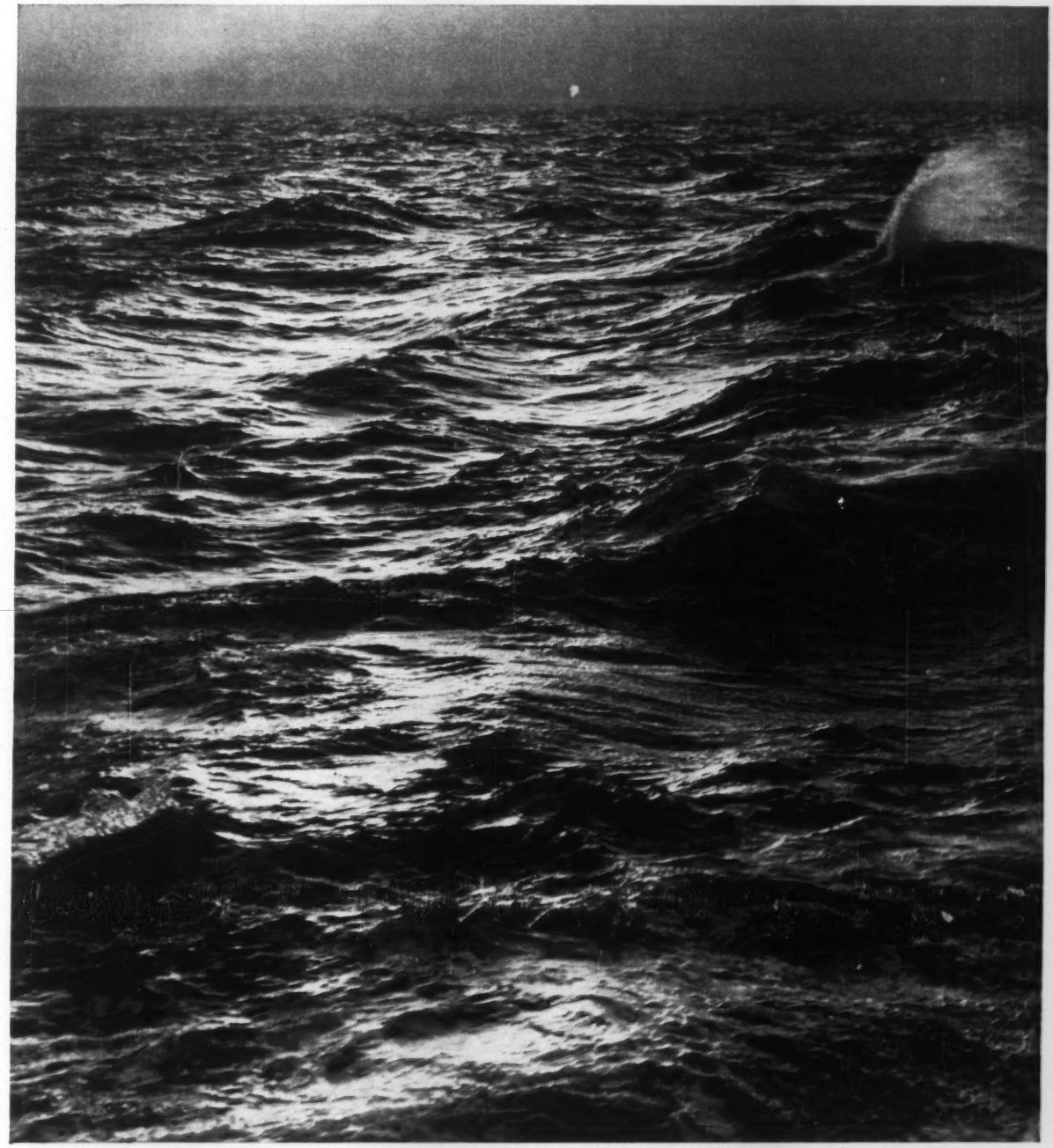
Second phase of the attack: More trailer-on-flat-car equipment. This means Soo will be able to carry more trucks containing LCL shipments on rail routings. Hence, additional LCL revenue to the railroad line.

Sales Campaign—Also, Soo plans an extensive sales campaign behind its LCL drive. Traffic solicitors, for example, will have special incentives for LCL shipments.

Behind this new attempt for the railroad are Soo's president, L. H. Murray, and Mr. Klingel. Though the LCL plan may be considered with pessimism by many railroad executives, Soo believes it can move LCL from the liability column. Figures hint that it could become a railroad's fastest growing asset.

It's a formidable switch from most railroad thinking. But enough new ideas have come from the Midwest's railroads that many shippers and interested parties will be watching the Soo Line as the new program starts to roll.

DISCUSSING PLANS: Talking over the plans for the Soo Line's drive to regain LCL profits are, from left: George Frank, Middle West Service Co.; T. R. Klingel and L. H. Murray, of the Soo Line.



There's business out there.

You're looking at more than a horizon. It's a future, yours and America's. Out there is Europe and Latin America and Asia and Africa. But in 1960, of all U.S. manufacturers, less than 5% saw these foreign shores for what they are worth: a 19-billion-dollar export market, a vast source of foreign trade.

Move in for your share. Build your business and help keep America growing. Extra production creates more jobs, helps balance the outflow of gold, and wins new friends abroad with U.S.-made products.

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Now's the time to discover the many ways in which your business can grow. In the lucrative export markets. In new U.S. markets. In developing new products. In attracting new industry to your community. Just write or phone the U.S. Department of Commerce Office of Field Services in your city, or Washington 25, D.C. They are ready to help you grow with America!

NOW'S THE TIME TO GET GROWING IN A GROWING AMERICA!

Delivery Promises Keep Moving Out

Mill delivery estimates are still lengthening, with the Chicago market showing the greatest change.

Plate deliveries are stretching out a week or more in all major markets.

■ Mill lead times continue stretching out. Following the trend begun in July, delivery estimates on strip, bar, and plate are lengthening in most markets. (See table, below.)

The Midwest is the most active area with deliveries on almost all products moving up. Mills in Chicago, for example, are quoting a week to two more on flat-rolled products, bar, plate, structurals, and pipe.

Detroit Confused — Only market running counter to the trend is Detroit. With the auto labor situation still unsettled, sheet and strip deliveries shortened a week on the long side, as did cold-finished bar. Hot-rolled bar delivery promises, however, extended 1 to 2 weeks.

Gains for plate are reflected in a firming of deliveries in most areas. Along the East Coast, both light and heavy plate moved up a week or two. One major mill is booked solid four weeks ahead, and unable to squeeze in even small tonnage orders.

At Pittsburgh, heavy plate advanced a week. Both heavy and light plate moved out a week at Chicago. And on the West Coast, heavy plate is now at 8 weeks delivery, and light plate, 7 weeks. In each case this is a gain of one week since the last IRON AGE survey.

Sheet and Strip—Automakers are working on low inventories, pending settlement of new labor contracts with the UAW. Apart from this, orders for other users are filling in on mill books.

The situation could reach critical levels soon in the **Midwest.** Delivery promises at **Chicago** mills are stretching out. Some buyers are looking ahead and rebuilding inventories. The buyers are checking producers to find if orders now on the books will get out as scheduled.

Galvanized and tinplate are holding at good levels. Big buyers of galvanized continue to be construction, home building, and auto markets.

Bars—Orders for many mills are running ahead of June and July levels. **Cleveland** mills believe August output could be the best since May. They expect the increase to continue through the fourth quarter. Fabricators and forgers are laying down some bar inventories.

At **Chicago,** however, cold-drawn bars are lagging. Generally, cold-finished bar orders lead an upswing in demand. This time they are not following that pattern. Bar mills there are operating at 18 turns a week or more. A step-up in orders from farm equipment makers, cold-finishers, and auto users could lengthen deliveries quickly.

Structurals — Bookings of fabricated structurals hit a five-year monthly high in July. But mill deliveries to fabricators haven't stretched out. Major producers in most markets are still quoting stock to 4 weeks.

July bookings of fabricated structurals in July were 456,000 tons. up 51 pct from July 1960, the American Institute of Steel Construction reports. However shipments dropped 15 pct from year-ago levels, down to 287,000 tons.

Stainless — Delivery estimates remain unchanged as demand stays slow. Producers are looking ahead to the fourth quarter when stronger sales are expected. Warehouses continue snagging off mill-sized orders in a very competitive market.

Wire — Manufacturers wire is doing well in the **Midwest.** Some **Chicago** area mills have already extended deliveries three weeks and lost orders as a result

Delivery Promises at a Glance

	East	Pittsburgh	Cleveland	Detroit	Chicago	West Coast
CR Carbon Sheet	3–5 wks	3–5 wks	3–5 wks	3–4 wks	4–6 wks	6 wks
HR Carbon Sheet	2–3 wks	3–4 wks	2–4 wks	2–3 wks	3–4 wks	6 wks
CR Carbon Strip	3–5 wks	4–5 wks	3–5 wks	3–4 wks	4–6 wks	4–5 wks
HR Carbon Strip	2–3 wks	3–4 wks	2–4 wks	2–3 wks	3–5 wks	5 wks
HR Carbon Bars	2–4 wks	2–3 wks	2–4 wks	2–4 wks	2–4 wks	4–5 wks
CF Carbon Bars	2–4 wks	2–3 wks	Stock-4 wks	Stock-4 wks	2–4 wks	1–2 wks
Heavy Plate	3–5 wks	3–4 wks			2–3 wks	8 wks
Light Plate	2–3 wks	1–2 wks	1–3 wks		2–3 wks	7 wks
Merchant Wire	Stock	Stock	Stock		3–4 wks	Stock
Oil Country Goods	Stock	Stock	Stock		Stock-4 wks	
Linepipe	Stock	1–4 wks	Stock		2–3 wks	Stock
Buttweld Pipe	Stock	Stock	Stock	Stock	2–3 wks	Stock
Structurals	2–4 wks	1–2 wks	1–4 wks	1–4 wks	3–4 wks	Stock-4 wks
CR Stainless Sheet	Stock-4 wks	Stock-3 wks	Stock-3 wks	Stock-5 wks		
CR Stainless Strip	Stock-4 wks	Stock-3 wks	Stock-3 wks	Stock-5 wks		

COMPARISON OF PRICES

(Effective Aug. 28, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Aug. 28 1961	Aug. 21 1961	July 31 1961	Aug. 30 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	49.50	49.50	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.49¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Aug. 28 1961	Aug. 21 1961	July 31 1961	Aug. 30 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti.	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn. cents per lb‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$36.50*	$35.50	$35.50	$31.50
No. 1 steel, Phila. area	39.50	39.50	39.50	34.50
No. 1 steel, Chicago	39.50*	38.50	36.50	31.50
No. 1 bundles, Detroit	35.50	35.50	35.50	29.50
Low phos., Youngstown	41.50	41.50	40.50	35.50
No. 1 mach'y cast. Pittsburgh	45.50	45.50	45.50	47.50
No. 1 mach'y cast. Phila.	49.50	49.50	49.50	49.50
No. 1 Mach'y cast. Chicago	49.50	49.50	47.50	47.00
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$38.50*	$37.83	$37.17	$32.50
No. 2 bundles	25.17*	24.50	24.17	22.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$31.00	$31.00	$31.00	$33.00
Copper, Lake, Conn.	31.00	31.00	31.00	33.00
Tin, Straits, N. Y.	122.25†	119.50**	117.125	102.25
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	26.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Larado, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strip.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Dealers Start To Act Bullish

Scrap dealers are beginning to look bullish as domestic demand picks up.

However, a weakened export outlook in the fourth quarter could change the picture.

■ Scrap dealers, in general, are beginning to take a bullish approach to the market.

Reason: Mill activity is picking up and dealers figure the time is fast approaching when inventories will have to be rebuilt. So, they aren't anxious to sell much tonnage at current prices.

But even with increased domestic demand, the fourth quarter might result in setbacks for some dealers. Export demand is weakening somewhat and there are chances this will continue through the end of the year. Shipping congestion in Japan has reduced interest in U. S. scrap for the present. And reported offers from European buyers in recent weeks have been at reduced price levels.

Many IRON AGE sources believe this will definitely affect the fourth quarter export picture. This, in turn, may weaken the entire overall market. But, for now, the scrap market reflects strength and climbing prices.

An interesting note: While nearly every market reports strength, firmness and the chance of higher prices, Detroit scrap dealers feel prices could weaken soon. They say mills appear to be well stocked.

The IRON AGE composite price for No. 1 heavy melting scrap climbed this week to $38.50. The composite price for No. 2 bundles is also up to $25.17. This is the first time in several weeks that the composite prices have climbed.

Pittsburgh — Strength at broker and dealer levels brought selective price increases this week. There has not been enough activity to indicate how far the market has moved. But all signs point to higher prices. The general feeling is that it will take more money to produce even the small tonnages that have been required locally. There is no assurance, yet, that volume will increase enough to force a sustained price rise.

Chicago — Scattered mill purchases again forced the market up. At least one auto list was sold prior to press time at existing prices. But other grades show new strength. Rebound in foundry demand is focusing attention on these grades. But brokers are having difficulty getting material.

Philadelphia—Dealers are beginning to be bullish as mill activity increases. While there are no price changes this week, most area scrapmen look for an upswing in the next week or two. Mills are definitely in the market for top grades, but dealers are holding out for the higher price. Export demand is still firm.

New York—Dealers in this area are more optimistic. Domestic business, as in the last year or so, is still restricted to small tonnages by small mills. And even export is between buying periods. But most dealers are now sure that September will bring better business.

Detroit—Things are quiet. Some brokers say they wouldn't be surprised to see the market weaken some in September. Mills reportedly have ample inventory. An estimated 50,000 tons of bundles will be up for bidding on the September industrial list.

Cleveland—Market continues to have a bullish undertone as dealers and brokers feel that mills will soon start building inventories. But the mills are still actively resisting higher prices.

Cincinnati—There is still strength in this market. And additional increases are expected in September. Upriver points will probably continue taking scrap for inventory. Local demand is also strong.

St. Louis—Market is strong. A very active demand for No. 2 bundles exists. In fact, demand exceeds supply at present, and mills are reaching out of the area to fill their needs. Special deals are being made at higher prices.

Birmingham — Scrap sales this week were confined principally to foundry grades. Electric furnace and foundry scrap is becoming scarce. Some brokers are still filling orders placed earlier in the month. Cast buyers are still out of the market.

Buffalo—The market is quiet in the face of an auto industry strike threat. Dealers look for some activity after this week, however. Prices will probably remain firm.

Boston—Though there is still no change in the prices, the market is beginning to firm and business is picking up. Price increases are possible in the near future.

West Coast—Prices continue to gain strength. All along the Coast, the price of No. 1 and No. 2 heavy melting rose $2 to $3 per ton. The trade looks for a strong fourth quarter.

Houston—Market has undertones of firmness. Intake has been slow but exporters have been filling orders at higher prices. Some orders for No. 1 heavy melting scrap are going for as high as $42.

SCRAP PRICES *(Effective Aug. 28, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	44.00 to 45.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	51.00 to 52.00
RR specialties	46.00 to 47.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	85.00 to 90.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 42.00
No. 1 factory bundles	44.00 to 45.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. forge crops	49.00 to 50.00
Low phos. punch'gs plate, ¼ in. and heavier	47.00 to 48.00
Low phos. 2 ft and under	45.00 to 46.00
No. 1 RR hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	49.00 to 50.00
Rerolling rails	61.00 to 62.00
Rails 2 ft and under	52.00 to 53.00
Angles and splice bars	47.00 to 48.00
RR steel car axles	61.00 to 62.00
RR couplers and knuckles	47.00 to 48.00
Cupola cast.	43.00 to 44.00
Cast iron wheels	35.00 to 36.00
Malleable	48.00 to 49.00
Stove plate	38.00 to 39.00
Steel car wheels	46.00 to 47.00
Stainless	
18-8 bundles and solids	190.00 to 195.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	95.00 to 100.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	13.00 to 14.00
Mixed bor. short turn.	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings	29.00 to 30.00
Low phos. 5 ft and under	43.00 to 44.00
Low phos. 2 ft punch'gs	45.00 to 46.00
Elec. furnace bundles	43.00 to 44.00
Heavy turnings	27.00 to 28.00
RR specialties	44.00 to 45.00
Rails, 18 in. and under	52.00 to 54.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	42.00 to 43.00
Malleable	48.00 to 49.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	42.00 to 43.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	33.00 to 34.00
Heavy breakable cast.	30.00 to 31.00
Drop broken cast.	44.00 to 45.00

Youngstown

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	18.00 to 19.00
Low phos. plate	41.00 to 42.00

Cleveland

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	36.50 to 37.50
No. 1 factory bundles	42.00 to 43.00
No. 2 bundles	22.50 to 23.50
No. 1 busheling	36.50 to 37.50
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft & under	41.00 to 42.00
Low phos. punch'gs plate	37.50 to 38.50
Drop forge flashings	35.50 to 36.50
Foundry steel, 2 ft & under	34.00 to 35.00
No. 1 RR hvy. melting	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
Rails 18 in. and under	52.00 to 53.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	48.00 to 49.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	39.00 to 40.00
Malleable	51.00 to 52.00
Stainless	
18-8 bundles	175.00 to 180.00
18-8 turnings	100.00 to 105.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Cast iron borings	15.00 to 16.00
Low phos. plate	37.00 to 38.00
Structural and plate, 2 ft and under	39.00 to 40.00
Rails 2 ft and under	48.00 to 49.00
Scrap rails, random lgth.	38.00 to 39.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	29.00 to 30.00
Foundry steel, 2 ft.	31.00 to 32.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	14.50 to 15.50
Shoveling turnings	16.50 to 17.50
Cast iron borings	24.00 to 25.00
No. 1 RR hvy. meltings	38.00 to 39.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	45.00 to 46.00
RR specialties	42.00 to 43.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	32.00 to 33.00
Cast iron car wheels	34.00 to 35.00
Rerolling rails	56.00 to 57.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	38.00 to 39.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft	43.00 to 44.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rail, random lgth.	42.00 to 43.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	44.00 to 45.00
No. 1 cupola cast.	42.00 to 43.00
Stove plate	42.00 to 43.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	18.00 to 19.00
Mixed bor. and turn.	5.00 to 6.00
Machine shop turnings	1.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	38.00 to 39.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	32.00 to 33.00
Drop forge flashings	32.00 to 33.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	13.00 to 14.00
Heavy breakable cast.	28.00 to 29.00
Mixed cupola cast.	31.00 to 32.00
Automotive cast.	40.00 to 41.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	70.00 to 75.00
430 bundles and solids	70.00 to 75.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	3.50 to 4.00
Shoveling turnings	8.00 to 8.50
Clean cast. chem. borings	17.50 to 18.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	29.00 to 29.50

San Francisco

No. 1 hvy. melting	$45.00
No. 2 hvy melting	42.00
No. 1 dealer bundles	28.00
No. 2 bundles	25.00
Machine shop turn.	$16.00 to 17.00
Cast iron borings	16.00 to 17.00
No. 1 cupola cast.	47.00

Los Angeles

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	41.00
No. 1 dealer bundles	28.00
No. 2 bundles	25.00
Machine shop turn.	15.00
Shoveling turnings	15.00
Cast iron borings	15.00
Elec. furnace 1 ft and under (foundry)	50.00
No. 1 cupola cast.	$46.00 to 47.00

Seattle

No. 1 hvy. melting	$45.00
No. 2 hvy. melting	42.00
No. 2 bundles	$25.00 to 26.00
No. 1 cupola cast.	36.00
Mixed yard cast.	31.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$31.00
No. 2 hvy. melting cut 3 ft and under	28.00
No. 1 dealer bundles	31.00
No. 2 bundles	23.50
Mixed steel scrap	23.00
Bush., new fact., prep'd	31.00
Bush., new fact., unprep'd	25.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	24.00
Machine shop turn.	10.00
Shoveling turnings	13.00
Cut structural plate 2 ft & under	$45.00 to 46.00
Unstripped motor blocks	28.00 to 29.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	28.00 to 29.00

Lead-Zinc Support Is Slow But Sure

Lead-zinc miners will likely get the government help they have been seeking.

But odds are it won't come this session. Congress closes shop in a few weeks and the bill is moving too slowly.

■ Small, domestic lead-zinc miners may get the government help they have been seeking for five years to offset foreign competition.

But they must be patient. It's almost a sure bet they won't get it before Congress closes shop in another week or so.

Latest Picture—The House of Representatives passed a bill calling for subsidies for small miners. This went to the Senate Interior Committee.

The committee reported out a subsidy bill. But it tacked on provisions for higher tariffs, to pay for the subsidies.

In the next week or so, many legislative roads must be traveled for the miners to get help.

Tariff Changes—The rider on the bill calls for tariff changes. So it must go through the Senate Finance Committee.

Then, it must be passed on the floor of the Senate. This would demand a joint committee meeting of House and Senate to thrash out which version is preferable.

The final version must be passed by both Houses.

Veto Looms—Just to keep the pot boiling, there are indications that the higher tariff provisions might prompt a Presidential veto.

President Kennedy, in his campaign for election, said he would have signed the subsidy bill for small lead-zinc miners that was vetoed by President Eisenhower last year. This is basically the same bill passed by the House.

But the new Administration is clearly disposed toward freer trade. Close observers say any bill calling for tariff hikes is doomed at the White House. The President's decision would be influenced by the strong State Dept. position against higher tariffs.

Hope Clings—One bright spot for the miners: The bill will not die if it is not passed before Congress adjourns. It will merely be shelved until Congress meets again in January.

The House-passed bill, generally considered to have the best chance of eventually becoming law, calls for payments to producers of less than 1500 tons each of lead and zinc the first year, 1200 tons the second year, 900 tons the third, and 600 tons the fourth year.

These subsidies would be paid when prices of each metal fall below 14.5¢ per lb—lead at New York, and zinc at E. St. Louis.

The payment for lead would be 75 pct of the difference between the peril point and the average price for the month. For zinc, the payment would be 55 pct of the difference.

No Limit—The Senate version would limit payments to no more than 2000 tons of each metal for a company in a year. There would be no limit to the size of the company. The subsidy would be the difference between the market price and 16¢ per lb.

The big issue: The Senate version calls for a basic increase in lead and zinc tariffs of 2¢ per lb. Another 2¢ would be tagged on when the domestic price falls below 13.5¢ per lb. Current price for lead is 11¢ per lb, and for zinc 11.5¢.

Domestic Outlook—The American Bureau of Metal Statistics reports a notable drop in imports of zinc in the first half.

The fall was due almost entirely to a sag in ore imports.

These dropped from 245,270 tons in the first half of 1960, to 199,659 tons in the first half of this year.

Beryllium

Beryllium took another step in its cost reduction program last week. Brush Beryllium Co. and Beryllium Co. of America reduced the price of pure beryllium rod by 10 pct in diameters from ¼ in. to 6 in. Earlier this year, virgin and blend powders were reduced 12 to 15 pct.

Tin Prices for the Week

August 22—120.50; August 23 — 121.625; August 24 — 121.50; August 25—122.00; August 28—122.250*.

*Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	31.00	30.00	5/16/61
Copper (CS)	31.00	30.00	5/17/61
Copper (L)	31.00	30.00	5/17/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	81.25	74.00	6/30/61
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 123.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.037	.047-.060	.076-.096	.154-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	47.8
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	147	126	145
Strip, CR	133	114	145
Rod, bar, HR	116	95	116
Angles, HR	116	95	116
Plates, HR	139	116	133
Shot, blocks	...	93	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	56.13	.....	53.61	57.32
Brass, Yellow	49.27	49.56	49.21	53.43
Brass, Low	52.15	52.44	52.09	56.21
Brass, Rod	53.17	53.46	53.11	57.23
Brass, Naval	53.94	60.25	47.75	58.10
Muntz Metal	51.94	.....	47.25	.....
Comm. Bz.	54.73	55.02	54.67	58.34
Mang. Bz.	57.71	61.54	51.27	.....
Phos. Bz. 5%	76.97	76.72	77.47	78.90

Free Cutting Brass Rod..... 34.77

TITANIUM

(Base 30,000 lb. f.o.b. customer's plant)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be ..... $ 5.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base .... $ 1.31
Cobalt, 97-99% (per lb)...$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined .....$29.95 to $36.95
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9% dollars per troy oz..$ 2.25
Iridium, dollars per troy oz. ..$75 to $85
Lithium, 98% .....$9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury dollars per 76-lb flask f.o.b. New York .....$188 to $191
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel 77.50
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz. ..$82 to $85
Rhodium .....$137 to $140
Silver ingots (¢ per troy oz.).....91.375
Thorium, per pg $43.00
Vanadium .....$ 3.65
Zirconium sponge .....$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 32.00
No. 120 ..... 31.25
No. 123 ..... 30.50
80-10-10 ingot
No. 305 ..... 36.00
No. 315 ..... 33.75
88-10-2 ingot
No. 210 ..... 43.75
No. 215 ..... 40.50
No. 245 ..... 35.75
Yellow ingot
No. 405 ..... 27.50
Manganese bronze
No. 421 ..... 31.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95.5 aluminum-silicon alloys
0.30 copper max. 23.75-24.25
0.60 copper max. 23.50-24.00
Piston alloys (No. 132 type) ..25.00-26.00
No. 12 alum. (No. 2 grade) ..21.75-22.25
108 alloy 22.25-22.75
195 alloy 24.75-25.75
13 alloy (0.60 copper max.) ..23.50-24.00
AXS-679 (1 pct zinc) 22.00-23.00

Steel deoxidizing aluminum notch bar granulated or shot
Grade 1—95-97½% 23.25-24.25
Grade 2—92-95% 22.00-23.00
Grade 3—90-92% 21.00-22.00
Grade 4 — 85-90% 20.00-21.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27	26¼
Yellow brass	20⅝	18½
Red brass	23⅞	23⅛
Comm. bronze	24¾	24
Mang. bronze	19¼	18½
Free cutting rod ends	19½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 28½
No. 2 copper wire 26½
Light copper 24¼
*Refining brass 25¼
Copper bearing material 24¼
*Dry Copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 28½
No. 2 copper wire 26½
Light copper 24¼
No. 1 composition 25
No. 1 comp. turnings 24½
Hvy. yellow brass solids .... 19 —19⅛
Brass pipe 18
Radiators 20½
Aluminum
Mixed old cast. ..... 12½—13
Mixed new clips ..... 14½—15
Mixed turnings, dry ..... 13 —14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 24¾—25¼
No. 2 copper wire ..... 22¾—23¼
Light copper ..... 20½—21
Auto radiators (unsweated) .. 16½—17
No. 1 composition ..... 21¼—21¾
No. 1 composition turnings .. 20¾—21¼
Cocks and faucets ..... 17¼—17¾
Clean heavy yellow brass .... 15¼—15½
Brass pipe ..... 17¼—17¾
New soft brass clippings .... 18⅜—19¼
No. 1 brass rod turnings .... 16½—17

Aluminum

Alum. pistons and struts .... 7 — 7½
Aluminum crankcase ..... 9½—10
1100 (2s) aluminum clippings 11¾—12¼
Old sheet and utensils ..... 9½—10
Boring and turnings ..... 4½— 5
Industrial castings ..... 10 —10½
2020 (24s) clippings ..... 11 —11½

Zinc

New zinc clippings ..... 5 — 5¼
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1¾— 2

Nickel and Monel

Pure nickel clippings ..... 56 —58
Clean nickel turnings 43
Nickel anodes ..... 56 —58
Nickel rod ends ..... 56 —58
New Monel clippings ..... 26 —26½
Clean Monel turnings ..... 18½—19
Old sheet Monel ..... 25 —25½
Nickel silver clippings, mixed. 20
Nickel silver turnings, mixed. 17

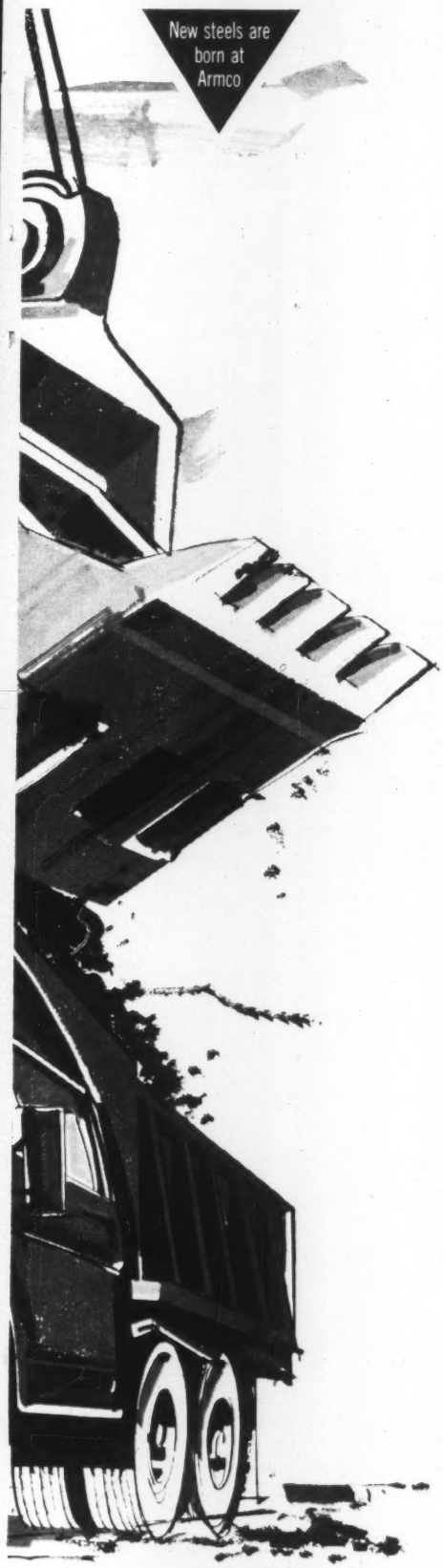
Lead

Soft scrap lead ..... 7¼— 7½
Battery plates (dry) ..... 3 — 3¼
Batteries, acid free ..... 2 — 2¼

Miscellaneous

Block tin ..... 90 —92
No. 1 pewter ..... 65 —67
Auto babbitt ..... 46 —47
Mixed common babbitt ..... 10 —10½
Solder joints ..... 15 —15½
Small foundry type ..... 9 — 9½
Monotype ..... 9¼— 9¾
Lino. and stereotype ..... 8½— 8¾
Electrotype ..... 8 — 8¼
Hand picked type shells .... 5¾— 6¼
Lino. and stereo. dross ..... 1¾— 2¼
Electro dross ..... 2½— 3

(Effective Aug. 28, 1961)



Armco Division, Armco Steel Corporation
2081 Curtis Street, Middletown, Ohio

I'd like more information on Armco's High Strength, Low Alloy Steel

No. ..... for use in .....

Name ..... Title .....

Firm .....

Street .....

City ..... Zone ..... State .....

Put "MUSCLE" Where You Need it ...AT LOW COST... With Armco High Strength Steels

You can build for strength at low cost with Armco High Strength Steels. Their strength-price relationships mean savings in light-weight structures that must be husky.

Meet your **exact** needs. Armco High Strength Steels are a **group** of special alloys with varying combinations of corrosion resistance, workability, and physical properties.

Complete selection

A special-analysis steel is produced for each of Armco's high strength, low-alloy steels. This selection is as complete as any group of low-alloy steels in the industry.

Find out for yourself how you can save with special Armco High Strength Steels. Just call your nearest Armco Sales Office or fill in and mail the coupon.

Steel

Identify sturdy, durable modern steels in your products. Use this label.

Armco High Strength Low Alloy Steels

Armco Type	No. 1	No. 2	No. 4	No. 5	No. 6	No. 7
Atmospheric Corrosion Resistance	4 to 6 times mild carbon steels	4 to 6 times mild carbon steels	Equal to copper-bearing mild steels	Equal to copper-bearing mild steels	Equal to mild steels	Equal to mild steels
Yield Point	50,000 psi min.	45,000 psi min.	50,000 psi min.	50,000 psi min.	50,000 psi min.	45,000 psi min.
Tensile Strength	70,000 psi min.	64,000 psi typ.	70,000 psi min.	70,000 psi min.	70,000 psi min.	65,000 psi min.
Fabricating Properties—As Rolled	Average	Good	Fair—parallel bends must have radius	Fair—parallel bends must have radius	Average	Good

ARMCO Armco Division

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$99.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, 13, Y1*	8.05 *U1, J3*	5.50 *13*	5.10 *U1, 13,Y1*	7.425 *Y1*	7.575 *U1, 13,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras

(Effective Aug. 28, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Electro-galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Cokes▲ *1.25*-lb. base box	Electro▲▲ *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*					7.525 *B3*	9.275 *B3*	6.40 *W6, S15*	†Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. ▲ COKES: 1.50-lb. add 25¢. ▲▲ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*					7.575 *A2*					
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*					7.575 *U1*	9.325 *U1*			$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*		6.775 *B3*		7.525 *B3*	9.275 *B3* 10.025 *B3**	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*		6.775 *A7*		7.525 *A7*			Hollowware Enameling 29 ga.—7.85 *U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; 7.95 *G2* at Granite City.		
	Canton-Massillon, Dover, Canfield, Ohio			6.875 *R1, R3*	7.50 *C19*								
	Chicago, Joliet, Ill.	5.10 *W8, A1*						7.525 *U1, W8*		6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		7.65 *R3*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*	6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*					7.525 *G3*	9.275 *G3*				
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*		6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*	6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1 Y1,*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*				7.225 *E2*						
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	7.225 *A7*	6.775 *A7*	7.225 *A7*						
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3*	7.65 *R3*	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*			$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	7.50 *E3*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3* 10.125 *U1, J3**	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5*	7.50 *W3*		7.225 *W3*	7.525 *W3*	9.275 *W3*		$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*			6.775 *Y1*		7.525 *Y1*	9.275 *Y1*	6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*					8.25 *K1*	10.40 *K1*		$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*		6.775 *T2*				6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

* Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective Aug. 28, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr'a. Bright
EAST	Bethlehem, Pa.		Listing reinforcing bar prices has been suspended. Major producers now quote prices only in response to specific inquiries.		6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3, S15*		7.70 *B5*	6.725 *B3,R3, S15*	9.025 *B3,B5, S15*	8.30 *B3*	5.30 *B3*				8.00 *W6, S15*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*										
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*			6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.											
	Fairless, Pa.	5.825 *U1*										
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.							5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*		7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*		7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*		7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*		7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.											8.10 *C9*
	Sterling, Ill.	5.775 *N4*					7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*		7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*		7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.375 *K1*			7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*			6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*		9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*						6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*					9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*			7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*										8.00 *A8* 8.35 *M4*
	Fairfield, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*		8.10 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*			6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Aug. 28, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
C19 Canfield Steel Co., Canfield, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.
S15 Seaway Steel Div., Roblin-Seaway Ind., Inc., North Tonawanda, N. Y.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery; Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	9.60	10.16	10.16	11.35	9.70	9.95	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.59	9.45	8.41	8.47	8.26	13.14	18.84	16.65	22.94	22.19
Boston**	.10	10.00	10.50	11.62	12.50	9.95	10.60	10.15	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.45	10.20	11.95	11.85	9.55	10.05	9.60	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.28	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.33	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.48	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	10.65	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		8.67	9.48	11.35[3]	10.23	7.91	8.31	8.08	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	12.15	12.10	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.78	10.50	10.95	11.44	9.47	9.82	9.67	12.85	18.59	16.68	22.69	21.04
Milwaukee**	.15	9.51	10.49	10.42	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.34	20.59
New York**	.10	10.17	10.88	11.45	12.47	10.32	11.00	10.54	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.60	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.68	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		10.40	12.25	12.35	12.40	10.55	11.00	10.40	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.75	11.75[2]	11.95	12.80	10.90	11.20	10.65	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.73	10.66	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	9.72	10.39	11.54	11.89	9.56	10.07	9.72	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier: [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Aug. 28, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	71.00†
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

Plain finish—packaged and bulk	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

(Minimum plating charge — $10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	26.75	29.25–26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	31.50	35.00–31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	43.50	46.75	45.00	49.50	56.75	49.50	76.75	62.25	75.25	40.25	40.25	42.50	38.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	29.75	33.25–29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown. *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford. Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6;* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *I4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport. Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1:* Claymont, Del; *P2.*

Forging billets: Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

NOTE: Ferroalloy prices are published in alternate issues.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	AISI
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Aug. 28, 1961)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Chicago *W7*	173	.....	.....	.....	.....	9.00	9.55†
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.80
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.5ə
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2**	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
SparrowsPt. *B3***	175	.....	...	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

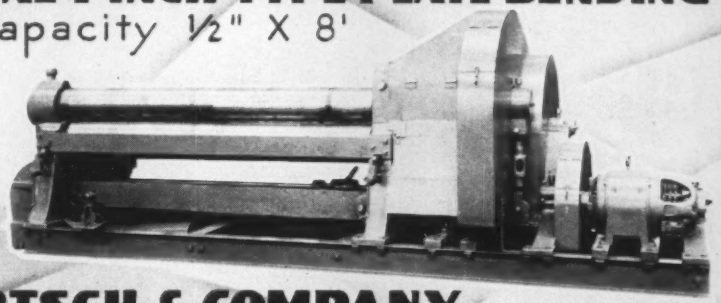
Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: P. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

INITIAL PINCH TYPE PLATE BENDING ROLL

Capacity ½" X 8'



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Light and heavy machinery for all classes of sheet metal, plate and structural work

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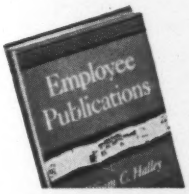

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Clare & Kloman Sts., Westport, Baltimore, Md.

THURSDAY SEPT. 14, 1961

AT 11 O'CLOCK A. M. (E.D.T.)

For full particulars of complete list of equipment, contact the undersigned auctioneers.

A. J. BILLIG & CO., AUCTS.

16 E. FAYETTE ST., BALTIMORE 2, MD. PL 2-8440

U. S. Steel Supply's Liberatore: missile makers and milkmen depend on his Stainless Steel

Order your Stainless Steel from a Stainless Steel Service Center.

Jack Liberatore, sales manager of U. S. Steel Supply's San Francisco Service Center, likes to compare his operation to a grocery store. "We carry a lot of staples, like beans and bacon, but then we carry a few special items, like caviar, too." He's speaking of his Stainless Steel inventory. "Beans" are commonly used sizes and grades; "caviar" refers to special items, sizes and grades for out-of-the-ordinary requirements.

A "caviar" customer of USS Supply's San Francisco operation is the Lox (for liquid oxygen) Equipment Company of Livermore, California. Lox began small with some 20 men on the payroll. They landed a government contract to manufacture vessels to store liquid oxygen, used to power Titan missiles. The payroll immediately went up to 250 men and Lox placed the largest single order ever handled by the U. S. Steel Supply Division at one time.

Lox's requirement added up to a whopping challenge. The contract called for the firm to build 180 vessels, which were to be buried on the missile bases, including 36 each of five different sizes. The largest was a 26,000-gallon vessel 12 feet in diameter and 58 feet long. Lox had about twelve months to do the job. Thanks to lots of help from Jack Liberatore, they met the deadline.

Liberatore expedited the needed steel from U. S. Steel in Pittsburgh. Lox put on three shifts, opened a second plant in Oakland, and began 7-days-a-week operations. Robert Hampton, (above) owner of Lox Equipment Company, put in 17-hour days for a major part of the twelve months. New equipment had to be bought and installed—including a Lox-developed vacuum system using electronic leak detectors.

At first they fell behind schedule. Liberatore fed Lox enough specially cut Stainless Steel plates, and Lox moved ahead of schedule. They delivered the last shipment in November, 1960, eight days ahead of the agreed date. Government officials told Hampton it was the largest amount of equipment of its kind ever produced in such a short time.

Here are some of the problems USS Supply and Lox met and overcame: the tanks were cylindrically shaped, like a railroad tank car, to be buried horizontally. They had to be "vacuum-jacketed" and able to withstand a wide range of pressures and temperatures—all the way down to −320°F for tanks holding liquid nitrogen. They had to be strong enough to take tremendous

forces—the calculated force a nuclear bomb striking a few miles away would exert on the underground vessels. Solution: a carbon steel outer jacket and a Stainless Steel inner shell. Why Stainless? For corrosion resistance and impact strength at low temperatures. A layer of insulation was inserted between the inner and outer jackets, making a sort of giant Thermos bottle that had to withstand high pressure and low temperatures without leaking (hence the electronic leak detectors). It takes about five months to build one of Lox's tanks.

Granted, Lox's problems were unusual, bigger than most. We use it here as an example of the many services provided by Stainless Steel Service Centers. For many firms, Steel Service Centers provide a nearby Stainless Steel inventory, with facilities to deliver any size shapes to order—on time. Most Stainless Steel Service Centers also offer technical and metallurgical help to their customers. U. S. Steel Supply's San Francisco Service Center supplies Stainless Steel to everyone from missilemen to milkmen. Fabricators and manufacturers have come to depend on their service, just as they rely on the strength, corrosion resistance, ease of fabrication and attractive appearance of USS Stainless Steel.

USS TRADEMARK **United States Steel**

FERROALLOY PRICES

NOTE: Prices of Boiler Tubes, Clad Steel, C-R Spring Steel, Electrical Sheets, Electrodes, Electroplating Supplies, Metal Powders, Rails and Track Supplies, and Refractories are published in alternate issues.

Ferrochrome

.Cents per lb contained Cr, lump, bulk, carloads, del'd. 65-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	33.25
0.05% C....	34.00	1.00% C....	33.00
0.10% C....	33.75	1.50% C....	32.75
0.20% C....	33.50	2.00% C....	32.50

3-5% C, 53-63% Cr, 2.5% max. Si... 26.00
4-6% C, 58-63% Cr, 3-6% Si..... 22.50
5-8% C, 58-63% Cr, 3-6% Si..... 22.50
6-8% C, 50-56% Cr, 4-7% Si..... 22.00
4.00-4.50% C, 60-70% Cr, 1.2% Si.. 28.75
0.025% C (Simplex) 31.50
0.010% C max, 63-66% Cr, 5-7% Si. 32.50
0.010% C max, 68-71% Cr, 2% Si max 31.50
0.25% C max 33.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.)
Carloads, delivered, lump, 3-in x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	22.50	14.60
Ton lots	30.45	16.05
Less ton lots	33.40	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%; Ca 5 to 7%.

Carload bulk 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 13.70
Ton lots packed in bags 16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

Mn	Palmerton, Pa. 10 lb, pig	35 lb, down	Neville Is., Pa. 35 lb
16-19%	.. $98.00	$96.00	$100.50
19-21%	.. 100.00	98.00	102.50
21-23%	.. 102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads, bulk 34.25
Ton lots, palletized 36.25
250 to 1999 lb 39.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si ...	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.

Carloads bulk 11.60
Ton lots, packed 13.25
Carloads, bulk, delivered, per lb of briquet 14.00
Briquets, packed pallets, 2000 lb up to carloads 16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe ..	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	13.50	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb...	2.40	3.30	4.55

(Effective Aug. 28, 1961)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y. per lb.

Carloads, bulk ..... 9.85¢
Ton lots ..... 11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.63

Ferrocolumbium, 58-62% Cb, 2 in. x D, del'd per lb con't Cb

Ton lots $3.45
Less ton lots 3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.89

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Vanadis, O., O., freight allowed, ton lots, per lb contained Ti $1.35
Less ton lots (200 lb and up) $1.37

Ferrotitanium, 30% low carbon, 0.10% C max., 27-32% Ti, Vanadis, O., freight allowed, per lb contained Ti, ton lots $1.35
Less ton lots (200 lb and up) $1.40

Ferrotitanium, 1-3% Carbon, 17-20% Ti, f.o.b. shipping point, freight allowed, carload per net ton $250.00
Ton lots $260.00

Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered ..... $2.45 (nominal)

Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth, Pa. $1.62
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.59

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots (packed) $1.46
Less ton lots (packed) 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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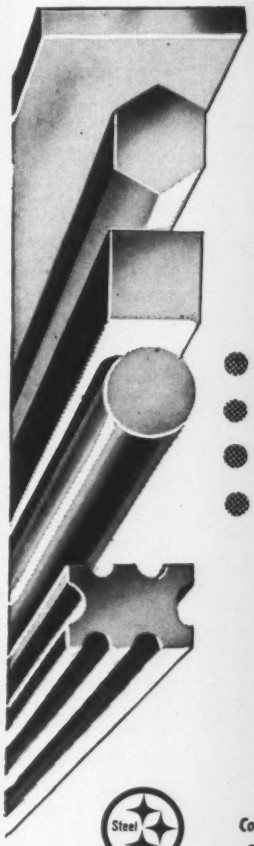

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Unit 1020 Magnet Crane
Insley Magnet Truck Crane
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Cat. #7 Angle Dozer • Model 4T Ditcher
TRACTOR & EQUIPMENT CO.
10006 Southwest Hwy., Oak Lawn, Ill.
Chicago Phone: HI-lltop 5-6800

3000/4500 TON BLH HIGH SPEED FORGING PRESS NEW 1954
DIAMETER OF RAM 62"
STROKE OF RAM 40"
2—17" DIA PULLBACKS
MOVING DOWN TYPE
WITH INTENSIFIER
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FRACTION OF ORIGINAL COST
POLLOCK INDUSTRIES INC.
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Most Dealers Remain Optimistic

Used machinery dealers, for the most part, are still optimistic over the outlooks for 1961.

They're looking for a definite upswing in the fourth quarter. Sales at present are down.

■ There is still a great deal of optimism among most used machinery dealers. But the present sales picture reflects a lack of customers.

According to statistics recently released by the Machinery Dealers National Assn., dollar sales in July dropped 22.5 pct from the June level. And, in further comparisons of the two months, dollar value of inventories dropped 4.4 pct. The number of machine tools invoiced at $200 or more was down 8.4 pct.

The number of total units in inventory increased 1.8 pct in July. Even though July sales were down from June, they were actually 8.4 pct above July, 1960 sales. In fact, the drop came as no surprise to many dealers. They point out that June was an "exceptionally good month." Sales during June climbed 26.7 pct above May and hit the high point of the year.

Looking Ahead—Most used tool dealers still feel the fourth quarter of this year will bring sales gains. Randy Vinson, executive director, MDNA, last month told The IRON AGE that 1961 sales will definitely be stronger in dollar volume and in the number of units sold (IA—July 13, p. 136).

His reasoning was based, among other things, on the fact that "Inquiries to the dealer are quite firm, generally. In other words, there is a feeling among the dealers that used machinery is moving quite well."

Innovations—Some used machinery dealers are looking for other markets when their home base appears weak. A Philadelphia dealer, for example, says sales in that city are "very limited."

He adds: "If we had to depend entirely on Philadelphia sales for our living at this time, we'd starve."

This particular dealer is active in a leasing plan across the country. He feels there are many customers for used tools if they can lease them on long-term or short-term plans. Some customers are given the option to buy the machinery at a later date.

Expectant Feeling—Another significant fact is that Pittsburgh used machinery dealers, as reported last week, have a feeling of expectancy. While their market is still spotty, they look for a definite upswing this fall.

"Of course my boss doesn't mind when I don't do my work . . . Though he probably would if he knew."

20' x 1/2" Shearing Capacity
20' x 1/2" Press Brake Capacity

Low, Low, Prices

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P. O. Box 543 Libertyville, Illinois
Chicago Phone: RO 1-0700
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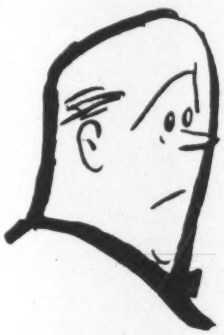
20 TON A.C.—72' SPAN CRANES

(5) 20 ton Whiting 3 motor A.C. overhead electric traveling cranes, suitable for inside and outside use. Cab operated, 30' lift, approximately 3000 ft. of runway and upright supports.

INTERSTATE MACHINERY CO., INC.
1421 W. Pershing Road Chicago 9, Illinois
Yards 7-5800



PUZZLED...

about personnel problems

Dissatisfied with present recruiting methods? The IRON AGE Employment Exchange is the meeting place for employers and men qualified in all phases of metalworking. For advertising rates, write to Chestnut and 56th Sts., Philadelphia 39, Pa.

Kling Pinch Type
PLATE BENDING ROLLS
7/8" x 16' Cap. NEW 1958
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8' x 10 Ga. Niagara Power Shear.
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FALK MACHINERY COMPANY
320 St. Paul Street, Baker 5-5887, Rochester 5, N. Y.

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—40" 2-HIGH BLOOMING MILL.
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1—32" & 20" x 56" 3-HIGH SHEET MILL with motor driven screwdown and pre-set controls.
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1—28" COLD SHEET MILL TRAIN 5 stands.
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2—10" x 14" 2-HIGH COLD MILLS, 100 HP DC drives, with one coiler.
1—8" x 12" 2-HIGH COLD MILL, 50 HP motor.
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1—16" BAR MILL, 3-high, single stand.
1—10" BAR MILL, 3-High, 5 stands with two 3-high 16" roughing stands, drives, tables, flying shear and double hot bed.
1—9" BAR MILL, 3-high, five stands.
3—HOT STRIP DOWNCOILERS, for widths up to 75" max. coil diameter 54".
1—VERTICAL OPEN-SIDE BAR SHEAR, 28" knife, capacity 1" x 24" or equal.
2—SQUARING SHEARS for ¼" x 156" sheets.
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1—42" WIDE COIL BUILD-UP LINE.
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1—1500 HP GEAR DRIVE, ratio 8 to 1.
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1—600 HP MOTOR, 2300/4600 volts, 3-phase, 60 cycle, 450 RPM.
1—175 TON HOT METAL CRANE, 54' SPAN, 4 GIRDERS.
1—75 TON HOT METAL CRANE, 58' SPAN, 4 GIRDERS.

COMPLETE MECHANIZED SHEET MILL CONSISTING OF CONTINUOUS FURNACES, 3-HIGH ROUGHING STANDS, 2-HIGH FINISHING STANDS, MILL TABLES, DOUBLERS, COLD MILLS, LEVELLERS, SHEARS, ANNEALING FURNACE, MECHANICAL PACK OPENER, ROLL LATHE.

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Cable "Foster, Pittsburgh" Telephone Atlantic 1-2780

MACHINERY FOR SALE

Plate Bending Rolls, Pinch Type
Bertsch #18B 1¼ x 10 ft. New 1953
Bertsch #11 ½ x 10 ft. New 1945
WRITE TO BOX H-212
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STAINLESS STEEL

Bought and Sold—All Types
Best Prices
S. S. MONSEIN STEEL
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500#/hr. LECTROMELT Top Charge amplidyne controls. Like new

250# LECTROMELT—185 KVA
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DETROIT FURNACES—10 lb. to 300 lb. Cap.

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50 KW; 80 KW; 100 KW 2 station 9600 cy.—200 KW 3000 cy. TOCCO Induction Heating and Brazing Units

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175 KW AJAX Induction Mltg. Installation Ideal for non-ferrous work. With 2 lift coils, can add tilt fces for steel.
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4—PANGBORN #2EZ Hydrofinish Cabinets Like New—Ideal for cleaning forging dies or fine finishing.

4—PANGBORN Tables, 6'LK, 6'LG, 8'LF, 9'LG
20x27 WHEELABRATOR
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This section appears weekly and carries announcements of metalworking materials or used machinery and equipment wanted.

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SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois
GROVEHILL 6-7474

WANTED TO PURCHASE—any quantity
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Bars—Billets—Sheet—Plate
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EDgewood 3-7300

WANTED
Good used tube reducer die turning (boring) and grinding machine for size 12" and 14" diameter dies. Advise price, delivery, location and condition, etc.
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Purchasing Agent

WEISS STEEL CO. INC.
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CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
40 Years of Steel Service

SURPLUS STEEL
NEW *WANTED* USED
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Consumers Steel & Supply Co.
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WANTED — USEABLE
HIGH SPEED STEEL BARS
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HIGHEST PRICES PAID
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11311 E. 8 Mile JE 9-1660 Warren, Mich.

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
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SPECIAL ACCOUNTS SALES REPRESENTATIVE

Chicago manufacturer of steel products requires an alert, aggressive, self-starting salesman to secure contract business from O.E.M.'s. You must have a broad metals industry background and knowledge, and some familiarity with metal tubing is very desirable. Initiative and imagination to visualize uses of tubing and to locate companies for whom we can fabricate all or part of their product, are essential. Opportunity for sales management responsibilities later. Pay on commission, or salary plus commission, target $12-15,000 area. Please describe your background and sales accomplishments fully and in confidence, particularly in securing contract business.

Write to BOX H-209
c/o The IRON AGE, Chestnut at 56th, Phila. 39

Electric Melt Shop
SUPERINTENDENT

for large West Coast manufacturer of ferrous and non-ferrous metals. Must be familiar with alloy steels, stainless and tool steels.

An Equal Opportunity Employer. U. S. citizenship required.

Send detailed resume and qualifications to:
BOX H-210
c/o IRON AGE, Chestnut at 56th, Phila. 39

FLAT DIE FORGE COMPANY—Located New York State requires Plant Superintendent, preferably man with actual hammersmith experience. Must be experienced in all phases of forging operations. Give history, age, salary desired, etc. Address Box H-207 c/o IRON AGE, Chestnut at 56th St., Philadelphia.

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Swiss metal fabricator, well established company desiring to expand, seeks licenses and/or distributorships for Switzerland and Europe in the machinery, dairy and beverage fields. President in U.S.A. from September 25. Write to Paul Umbehr, c/o Dr. Sturzenegger, 31 Rockledge Place, Cedar Grove, N. J.

If you have close personal contacts in open hearth and blast furnace departments of any steel mill we may be able offer you agency our refractory products. Will assist in getting products established and following thereafter. Excellent opportunity retired steel man. Products proven. Liberal commissions, large volume potential. No warehousing.

WRITE TO BOX H-211
c/o The IRON AGE, Chestnut & 56th Sts., Phila. 39

The IRON AGE Chestnut & 56th Sts., Philadelphia 39, Pa.
Please send me rates and general information about the Classified Section without obligation on my part.

Name ..... Title .....
Company .....
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City ..... Zone ..... State .....
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Bigger results with ROTOBLAST!

Day in, day out, seven heavy duty Rotoblasts work hard at cleaning the tremendous volume of castings produced at a large famous automotive foundry in the Midwest. At last count, each of the seven barrels had accumulated more than 600 hours of actual blast time with practically no need for maintenance or repairs.

Proof of the almost completely automatic operation of these machines is that just two men operate a line of six. (The seventh has a separate location for materials handling convenience.)

Whether your cleaning needs are big or small, Rotoblast has a standard type and size for the job, or specially designed equipment can be provided. Labor-saving automation can be furnished in a small unit just as easily as in seven big ones.

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A special heat-treating process makes Rotoblast Steel Shot and Grit solid, tough, able to take more punishment than ordinary abrasives. Because they are *extra* tough, Rotoblast abrasives last longer, work harder and lower your replenishing costs. We'll be glad to go into more detail. Just write:

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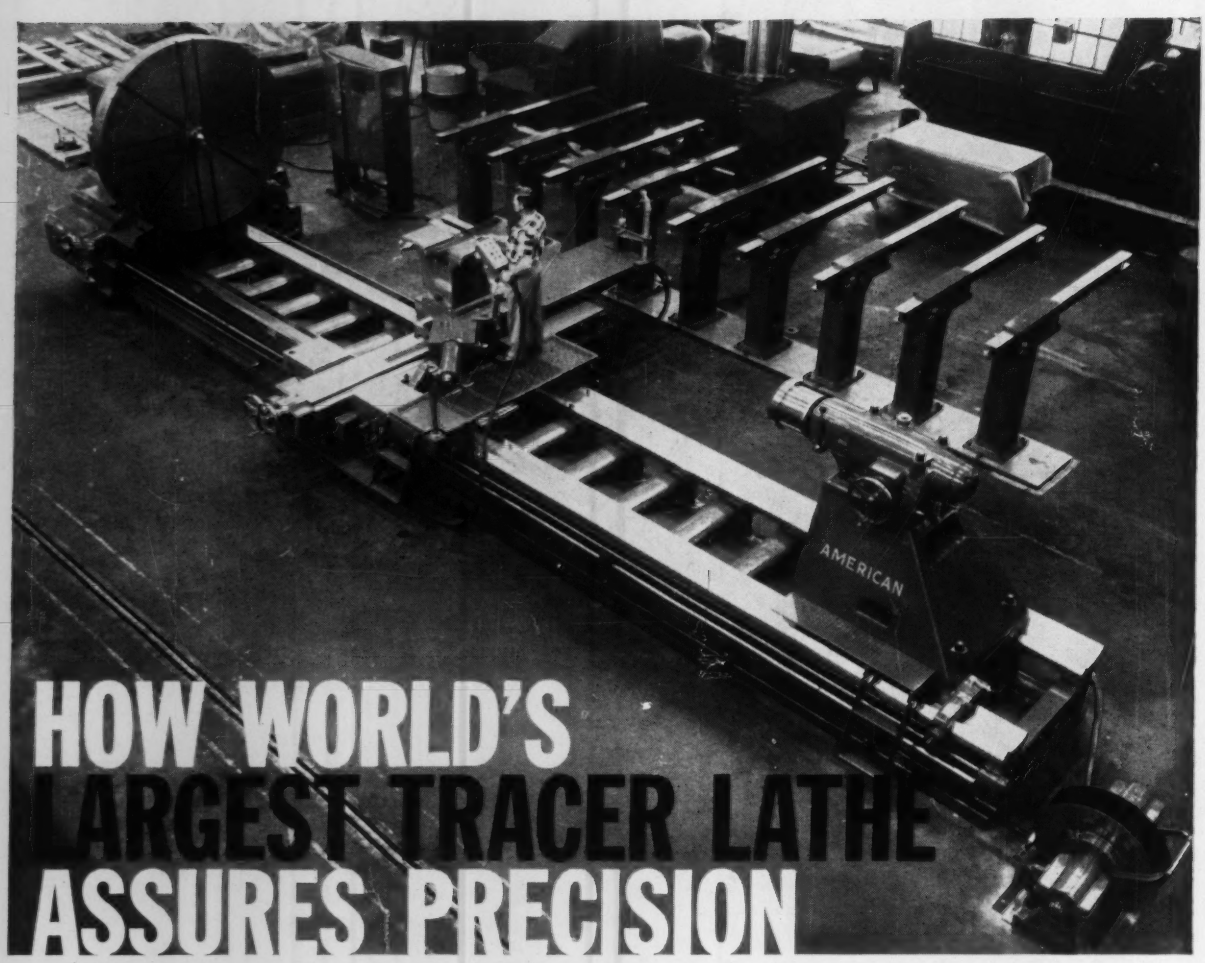

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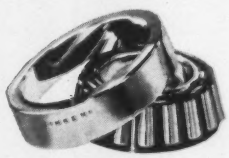
Engineers of The American Tool Works Co. design maintenance of high precision right into their new Maxi-Swing Tracer Lathe with 16 Timken® tapered roller bearings on the nose and center of the spindle, drive and intermediate shafts. That's because Timken bearings are designed and manufactured to take the big loads from all directions of this machine cutting ¾" deep into work pieces of up to 40 tons. And they do it through a range of 22 speeds, giving rigidity with compact mounting and ease of assembly.

ON-THE-SPOT ENGINEERING SERVICE. Our sales engineers can help you right at the design stage to get the most economical bearing in terms of needed capacity and precision. Why not call them in early?



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The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.